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REPORT

Park Meadows Brick Wall
Report

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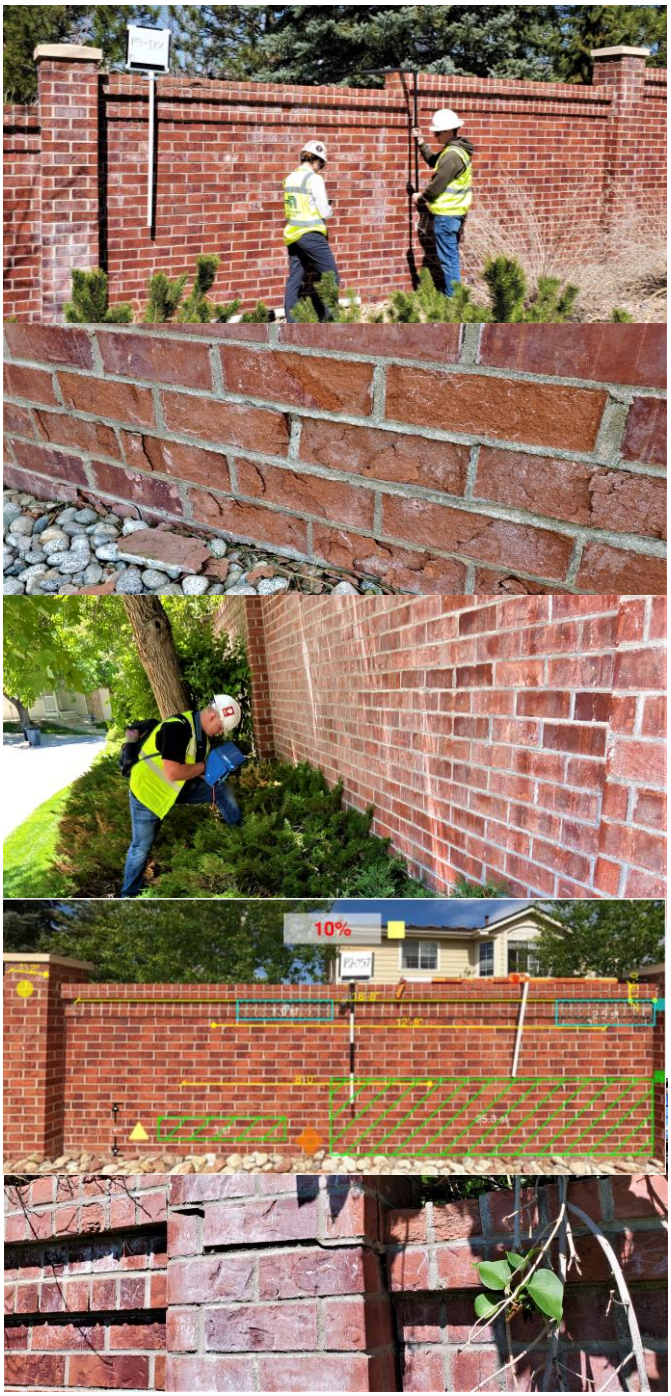
Park Meadows Brick Wall Study
ANA Job No. 20-235
September 3, 2021



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1.0 Executive Summary

ANA documented distress conditions on both sides of all 1422 brick wall panels that were part of this study in Lone Tree, Colorado. Distress was found to be extensive with sagging in 67% of panels, cracking in 96% of panels, and spalling in 96% of panels with caps. Distress was noted on rectified and scaled photographs of each panel so that quantities of each type of distress could be collected.

Additionally, grades were assigned to each panel based on a weighted scale established by the stakeholders and ANA so that area of concentration of panels in poor condition can be readily identified in heat maps. The City has also imported this data into its GIS software so that the grade information can be displayed on maps.

Interventions and maintenance items that do not address the fundamental causes of distress will tend to fail within a few years. This failure was observed at panel sagging areas where the cracks and gaps had been filled with mortar. Cracking associated with improper expansion joint conditions will also tend to reappear if the expansion joint conditions are not addressed.

Ultimately, the decisions regarding remedial action are subject to budget and other considerations that are beyond the scope of this report. However, ANA can offer the following recommendations based on technical considerations:

- Prioritize concentrated areas of panels in poor condition for earliest remediation since these panels will tend to deteriorate most quickly. Groups of at least ten contiguous panels will reduce mobilization costs.
- Replacement of entire panels offers the most permanent solution with the longest life cycle.
- Replacement of panel caps offers significant benefits but does not address panel sagging and several other types of distress.
- Maintenance interventions such as repointing cracks with mortar have some benefits, such as reducing localized water infiltration. However, these interventions will tend to have short life cycles unless the underlying causes are addressed.

2.0 Introduction

At the request of Park Meadows Metropolitan District (PMMD), Atkinson-Noland & Associates (ANA) performed a study of selected exterior brick walls within the city of Lone Tree, Colorado. The purpose of the study was generally to investigate and document the current distress conditions of the subject walls, develop recommendations for repair, and help prioritize repairs. The project was initiated through a public Request for Proposal (RFP) issued by PMMD on December 17, 2020. ANA began field observations for this project in May 2021. The assistance of Taylor Goertz and Shelley Cobau of IMEG, along with Jacob James, Justin Schmitz, Denisse Coffman, and Kyoko Chenhalls of the City of Lone Tree during this project was extremely helpful and is greatly appreciated.

2.1 Scope

The scope of services described in the RFP and refined over the course of the project generally consists of the following:

- Identifying each brick wall panel and organizing these panels into Phases (based on original construction) and Sections (based on contiguous areas).
- Documenting the condition of each panel at both the street side and yard side using high-resolution photography.
- Performing close-up observations of each panel and marking distress conditions on rectified and scaled photographs of the panels.
- Using a weighted scale established by the stakeholders, provide a grade or facility condition index (FCI) for each panel
- Provide grades and related metrics to the stakeholders in ways that are meaningful and useable.

2.2 Description of Structure

The brick screen walls are generally located along significant roadways within the City of Lone Tree and also serve as portions of the fence structure for back yards of adjacent residences. A view of a typical wall section is shown in Figure 1. The original design drawings indicate that the brick wall panels are to span between reinforced brick columns, and the wall panels are to be installed with a small gap beneath them.

Phase One Structural Drawings and Specifications indicate that the field of typical wall panels is comprised of "king size" units measuring 2 13/16" × 2 5/8" × 9 5/8", calling for the field of the wall to be 2 13/16" thick. Other brick unit sizes are used at the columns and cap or coping of the wall panels. Sloped pyramidal precast concrete caps have been installed at each of the wall columns/piers. Similar precast concrete caps were originally shown at the top of wall panels in the Design Drawings for Phase One, but brick caps (double rowlock) were shown in drawings stamped by PBS&J for Phases Two through Five. Brick caps were installed for all five phases of wall.

Figure 1. Overall view of typical brick wall panels.

Brick wall panels are typically reinforced using 3/16" diameter bed joint reinforcing at each course with bond beams called for at the bottom and near the top of the panel. The typical wall section is shown in Figure 2. The bottom courses of each panel are connected to the masonry above by a #14-gauge vertical smooth wire ("J-wire"). Wall columns include 4-#5 vertical reinforcing bars and bed joint reinforcing. Some details vary at locations where the wall is constructed on a slope, at gates, and at corners.

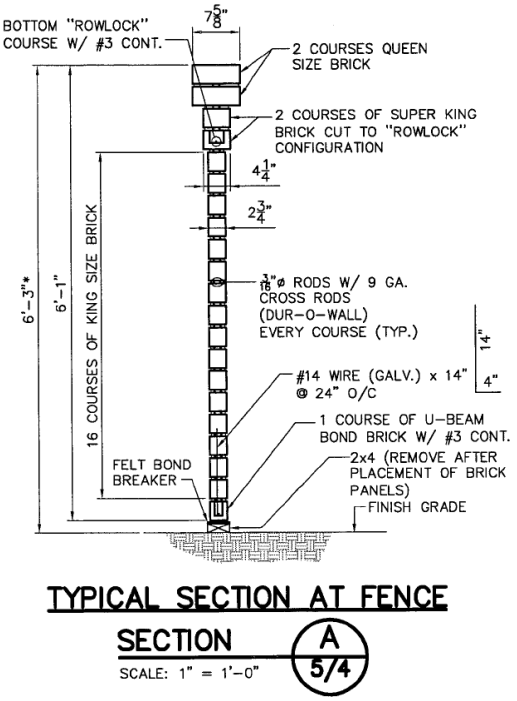


Figure 2. Typical section of wall panel from original design drawings.

2.3 Background

ANA has been involved with the subject brick wall since 2008. When ANA first looked at the brick wall only two conditions were looked at, localized cracking and distress related to expansion joint failure. Then, in 2011, ANA was retained by an attorney for the City of Lone Tree to look at the brick walls again as part of litigation claims related to construction and material defects. This investigation included verification of as-built conditions, testing of materials, and preparation of repair recommendations. The previous investigation also included documentation of distress conditions at a sample of 150 panels throughout the five phases of construction (30 panels in each phase). This report includes a brief comparison of conditions from approximately 10 years ago to the conditions observed in 2021.

3.0 Methodology

3.1 Dry Run

On April 7, 2021, several ANA employees performed a test of the photography and other documentation equipment to be used on the project. Several panels were available adjacent to a public walking trail that did not include private property on either side. As seen in Figure 3, ANA was able to test the use of GoPro cameras on booms (for photographs of the opposite side of panels), story poles (for scale), and panel label signage for efficacy. The equipment was refined and improved prior to use on the remainder of the project.

Figure 3. Photograph of documentation equipment being tried during dry run in April.

3.2 Communication and Notice to Residents

An important component of the ANA study was communication. This communication included several components:

- ANA conducted weekly project meetings with representatives from IMEG and the City of Lone Tree.
- Additional communication meetings with representatives from the PMMD Board and other stakeholders were held on an approximately monthly schedule throughout the project.
- Three presentations were made at the PMMD Board Meetings to update our progress on the project.
- One presentation was made to the City Council of the Town of Lone Tree to relate final findings.

- Direct communication to affected residents was issued through certified mail in advance of site observations (Figure 4 and Figure 5).
- Doorhangers were coordinated with City of Lone Tree for notice in areas where observations were happening and to request access to a limited number of back yards.

CITY OF LONE TREE

cityoflonetree.com | 303.708.1818
9220 Kimmer Drive, Ste. 100, Lone Tree, CO 80124

Hello Lone Tree Resident,

As you may be aware, the City initiated a program to install brick walls in 2001 to replace deteriorating wood fences in parts of the City. The program included the City paying for the construction of the walls and owning and maintaining them once installed. As part of this construction, an easement was created with the City and signed by each respective property owner for property adjacent to the brick walls.

Between 2011 and 2013, the City initiated litigation and received a modest monetary settlement from the engineer, contractor, and manufacturer of the wall as a result of brick spalling occurring at several locations. Over the last several years, the City has continued to evaluate maintenance needs on a case-by-case basis, prioritizing any structural repairs versus just aesthetic repairs. Now, with the walls being up to 20 years old, the condition of the brick walls needs to be thoroughly assessed before the City can determine next steps.

The City is very grateful to have partnered with Park Meadows Metropolitan District (PMMD) and their consultant Atkinson-Noland & Associates, Inc. (ANA) to conduct a study of the condition of the brick walls. This study is expected to start in May and continue through the end of July.

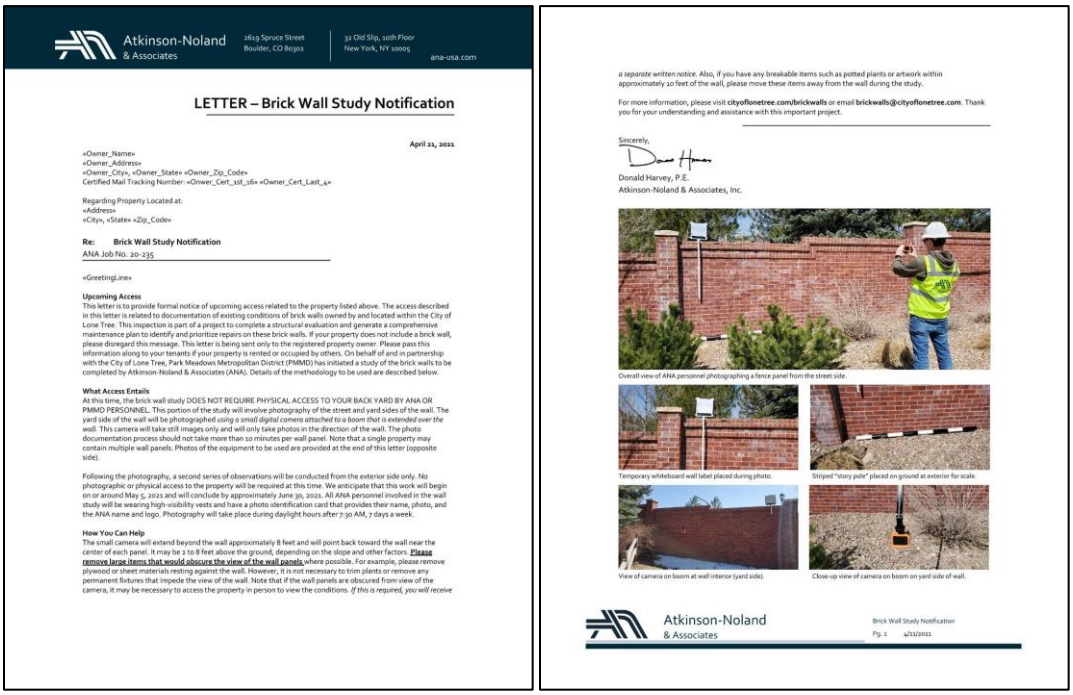
The letter attached from ANA provides further details on what the study will entail. In addition, a door hanger will be left at your residence a few days before the consultants are expected to work in your area.

Please know that access into your backyard is not anticipated for the initial investigation. However, if the interior of the wall cannot be assessed from the outside, you will be contacted for access request.

We thank you for your patience, and we are committed to keeping you informed during this process.

If you have any further questions about the brick walls or this study, please visit cityoflonetree.com/brickwalls, e-mail brickwalls@cityoflonetree.com or call Public Works at 303-662-8112.

Figure 4. Certified mail sent to all affected residents, issued by City of Lone Tree.



Atkinson-Noland & Associates | 2619 Spruce Street, Boulder, CO 80302 | 32 Old Slip, 10th Floor, New York, NY 10005 | ana-usa.com

LETTER – Brick Wall Study Notification

April 21, 2021

«Owner_Name»
«Owner_Address»
«Owner_City», «Owner_State» «Owner_Zip_Code»
Certified Mail Tracking Number: «Owner_Cert_1st_16» «Owner_Cert_Last_4»

Regarding Property Located at:
«Address»
«City», «State» «Zip_Code»

Re: Brick Wall Study Notification
ANA Job No. 20-235

«GreetingLine»

Upcoming Access
This letter is to provide formal notice of upcoming access related to the property listed above. The access described in this letter is related to documentation of existing conditions of brick walls owned by and located within the City of Lone Tree. This inspection is part of a project to complete a structural evaluation and generate a comprehensive maintenance plan to identify and prioritize repairs on these brick walls. If your property does not include a brick wall, please disregard this message. This letter is being sent only to the registered property owner. Please pass this information along to your tenants if your property is rented or occupied by others. On behalf of and in partnership with the City of Lone Tree, Park Meadows Metropolitan District (PMMD) has initiated a study of the brick walls to be completed by Atkinson-Noland & Associates (ANA). Details of the methodology to be used are described below.

What Access Entails
At this time, the brick wall study DOES NOT REQUIRE PHYSICAL ACCESS TO YOUR BACK YARD BY ANA OR PMMD PERSONNEL. This portion of the study will involve photography of the street and yard sides of the wall. The yard side of the wall will be photographed *using a small digital camera attached to a boom that is extended over the* wall. This camera will take still images only and will only take photos in the direction of the wall. The photo documentation process should not take more than 10 minutes per wall panel. Note that a single property may contain multiple wall panels. Photos of the equipment to be used are provided at the end of this letter (opposite side).

Following the photography, a second series of observations will be conducted from the exterior side only. No photographic or physical access to the property will be required at this time. We anticipate that this work will begin on or around May 5, 2021 and will conclude by approximately June 30, 2021. All ANA personnel involved in the wall study will be wearing high-visibility vests and have a photo identification card that provides their name, photo, and the ANA name and logo. Photography will take place during daylight hours after 7:30 AM, 7 days a week.

How You Can Help
The small camera will extend beyond the wall approximately 8 feet and will point back toward the wall near the center of each panel. It may be 2 to 8 feet above the ground, depending on the slope and other factors. **Please remove large items that would obscure the view of the wall panels** where possible. For example, please remove plywood or sheet materials resting against the wall. However, it is not necessary to trim plants or remove any permanent fixtures that impede the view of the wall. Note that if the wall panels are obscured from view of the camera, it may be necessary to access the property in person to view the conditions. *If this is required, you will receive a separate written notice.* Also, if you have any breakable items such as potted plants or artwork within approximately 10 feet of the wall, please move these items away from the wall during the study.

For more information, please visit **cityoflonetree.com/brickwalls** or email **brickwalls@cityoflonetree.com**. Thank you for your understanding and assistance with this important project.

Sincerely,

Donald Harvey, P.E.
Atkinson-Noland & Associates, Inc.

Overall view of ANA personnel photographing a fence panel from the street side.

Temporary whiteboard wall label placed during photo.

Striped "story pole" placed on ground at exterior for scale.

View of camera on boom at wall interior (yard side).

Close-up view of camera on boom on yard side of wall.

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Figure 5. Certified mail sent to all affected residents, issued by ANA.

- ANA created a project-specific website (cityoflonetree.com/brickwalls) with updates on observation locations and progress.
- The City of Lone Tree created a project-specific email address (brickwalls@cityoflonetree.com) for any questions residents had about the project.

3.3 Documentation

There are a total of 1422 individual brick panels that are part of the scope of work of this study. In order to better organize and label individual panels, these panels were organized into divisions and subdivisions. The original construction phasing plan included 5 different phases (called Phase 1 through Phase 5). These phases were used to break up the scope into divisions. These phases were then broken up by ANA into sections designated by letter. Each section was a contiguous line of wall, and sections were separated by either a break in the wall or a corner. The Phases and Sections used by ANA to organize the scope of work are shown in Figure 6. Finally, each panel within the project was given a numeric designation by Phase in sequence throughout that phase. For example, the 29th panel in Phase 3 would be designated P3-029. Note that the "beginning" and "end" locations of each Phase were chosen by ANA for convenience and simplicity. These are not necessarily where construction began or ended as the walls were erected. The example panel mentioned previously, P3-029, is located in Phase 3, Section B, which is located along the south side of Lincoln Avenue west of Centennial Ridge Park.

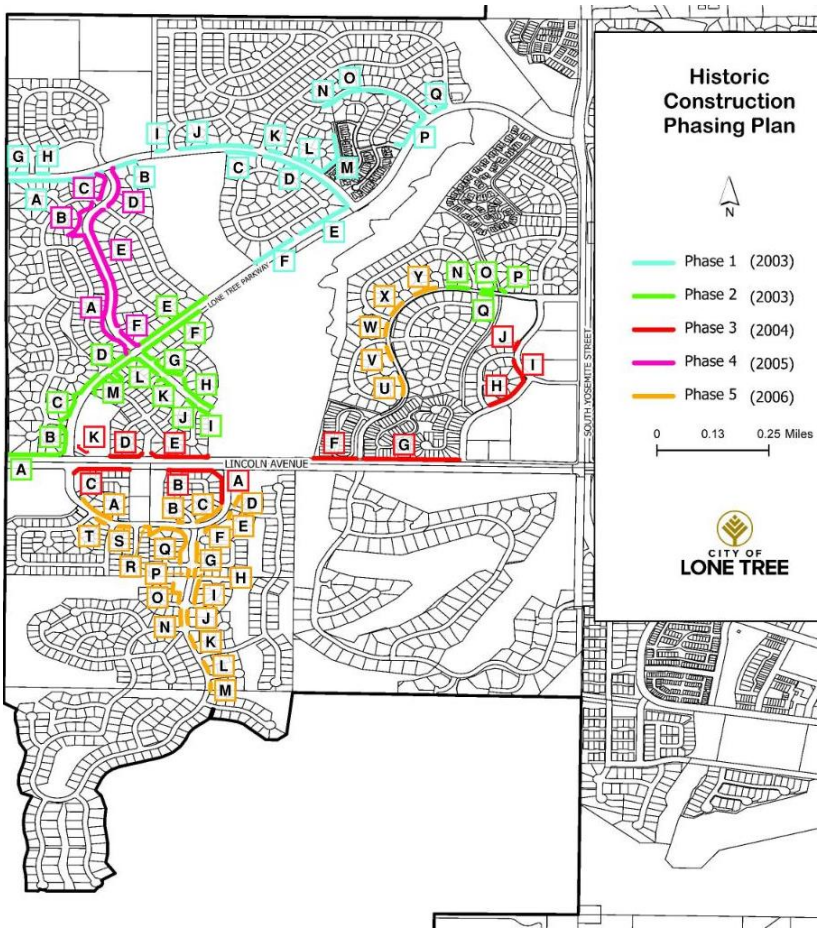


Figure 6. Map of study area in Lone Tree, Colorado showing different Phases in different colors. Sections are labeled with letters in each Phase.

The sections and panel numbers were also labeled in more detail on the plan view drawings from the original construction (Figure 7). The panel numbering was confirmed in the field prior to commencing the photodocumentation of the panels.

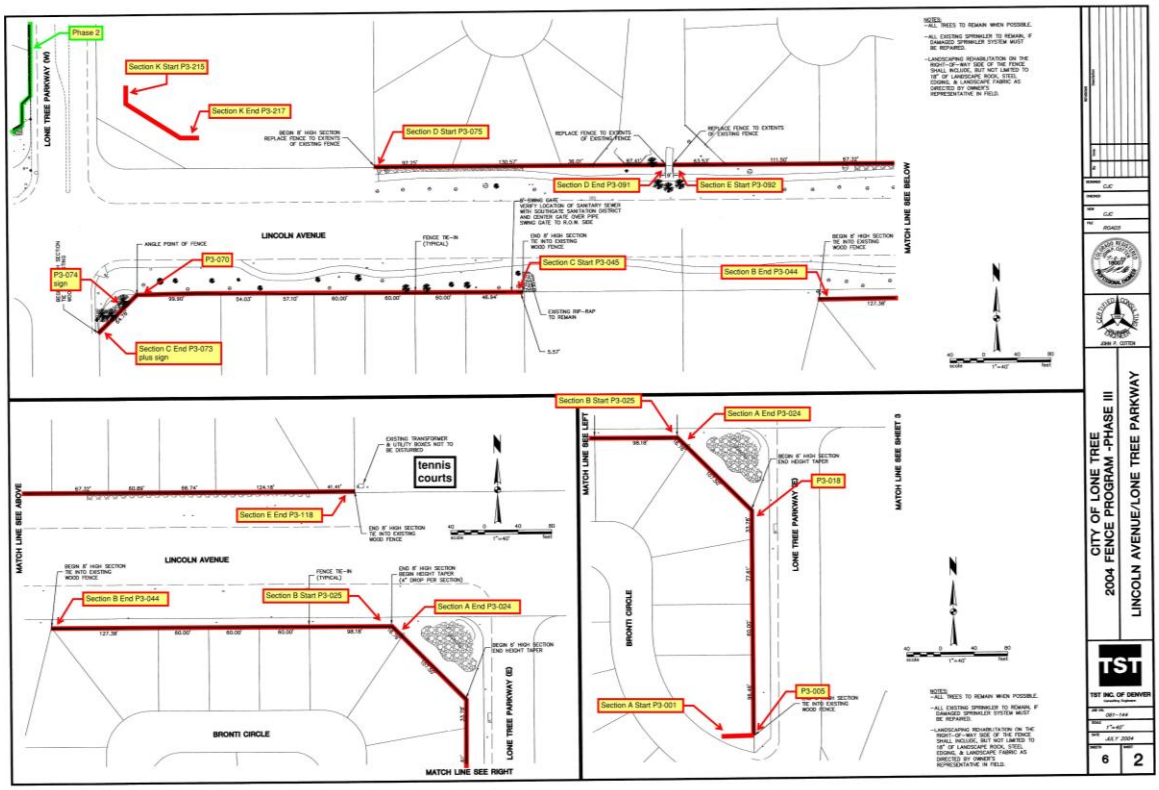


Figure 7. Sheet from the plan view original construction drawings, showing a portion of Phase 3 with the beginnings and ends of each Section labeled.

In order to document distress conditions throughout the study area, each panel was photographed on both the street side (Figure 8) and the yard side (Figure 9). These photographs were not used as the primary means of identifying cracks, spalls, and other distress since it can be very difficult to see these types of distress in photographs. Rather, these images were rectified (made orthogonal) and scaled so that they could be used as backgrounds for drawings that illustrate the distress conditions.

Figure 8. Typical panel photograph from the street side.

Figure 9. Typical panel photograph from the yard side.

The photographs include several components to help with documentation. A whiteboard with a vertical pole was used to provide the panel number (on both sides) and a vertical scale (Figure 10). The story pole (oriented horizontally) was used to provide horizontal scale with stripes of white and black at 1 foot on-center (Figure 10). A lightweight boom and camera were used to reach over each panel to take the yard side photos so that access to back yards could be limited (Figure 11). The image from the GoPro camera on the boom could be monitored in real time via a phone app so that the best angle could be selected for the yard side photographs.

Figure 10. (Left) Whiteboard with panel number and vertical scale. (Right) Story pole striped to provide horizontal scale.


Figure 11. View of camera (with orange protective cover) being lowered over a panel using a boom for photography of the yard side of a panel.

3.4 Rectification

In order to be able to take photographs of wall panels from close distance, wide angle lenses were used. These lenses create significant distortion ("fisheye") of the captured images. In order to use the photographs as background images for distress drawings with scalable quantities of distress, the images needed to be corrected to eliminate distortion. Rectification software was used to adjust the raw images (Figure 12) to become suitable orthogonal, scalable images (Figure 13) with straight edges.

The rectified images were imported into Bluebeam Revu drawing software and scaled based on the vertical and horizontal poles in the image, as shown in Figure 14. This ensured that any distress drawn on the panels could be measured within the software, resulting in reasonable quantity estimates of lengths and areas.

Figure 12. Unrectified photograph of panel P1-075.

Figure 13. Rectified photograph of panel P1-075.

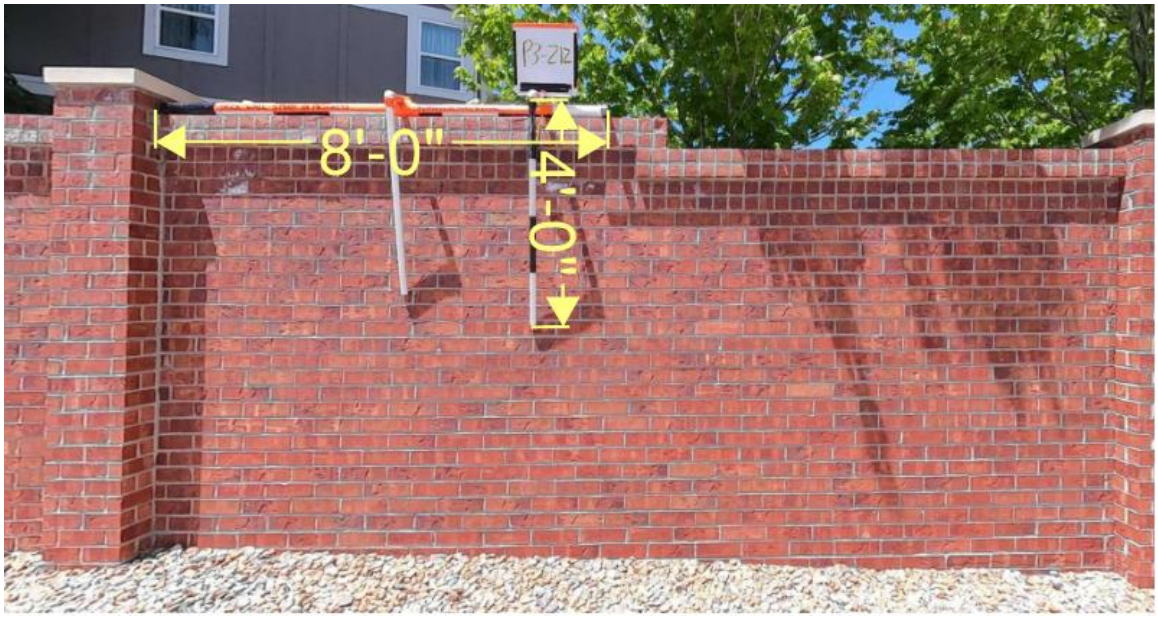


Figure 14. Rectified and scaled photograph of panel P3-212, showing 8′-0″ long horizontal story pole and 4′-0″ tall whiteboard pole.

3.5 Distress Mapping

Once rectified and scaled images of each panel were created, the Bluebeam software was used by a team of two ANA personnel to perform and document close-up observations of each panel. Different types of distress were marked on panels using different colors and symbols. The drawings were organized by Phase with one drawing sheet per panel. Significant distress visible on the yard side that is not visible on the street side was marked on the street side photo with a note that the distress is visible on the opposite side. An example of a distress drawing of a panel is provided in Figure 15.

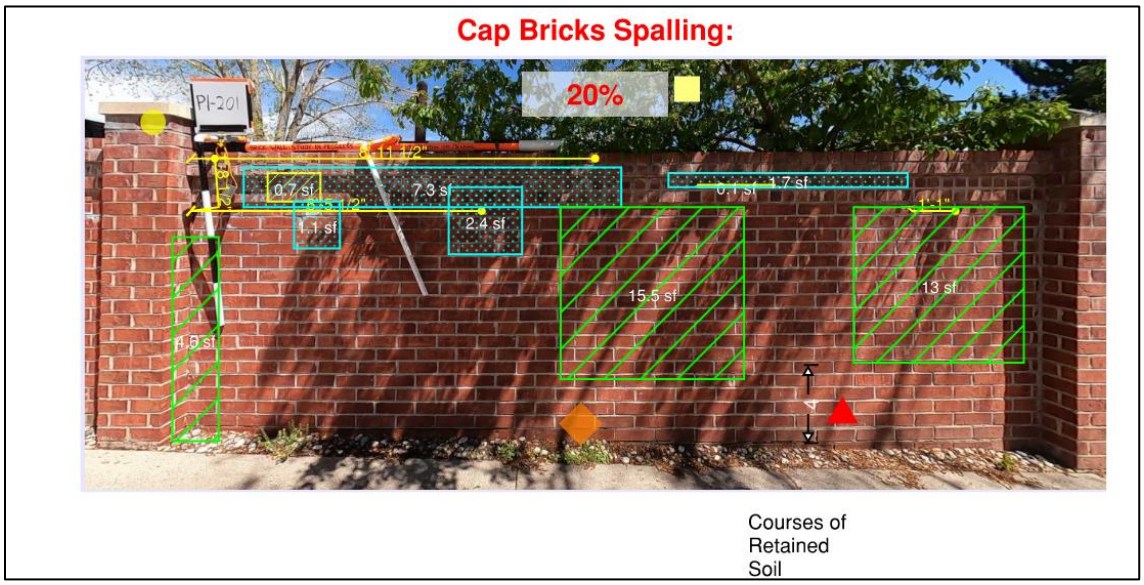


Figure 15. Example of distress mapping of a panel at P1-201.

Distress documentation included hands-on observations of each panel. The distress was not extracted only from observations of the photographs. This was necessary because many types of distress are not readily visible in the photographs, such as small cracks and expansion joint conditions. The Bluebeam software used to document distress automatically generates a legend that summarizes the total quantities of each type of distress on a panel. An example of a distress legend is shown in Figure 16. Different shapes and colors are used to represent different types and levels of distress.

Distress Legend

Description	Quantity	Unit
02 Sag Panel Sagging	1	Count
07 Crack - Length	18.210	ft
08 Panel Brick Spalling - Area	0.8	sf
09 Column Spalling Beneath Cap - Count	1	Count
12 Efflorescence - Area	12.5	sf
13 Cleaning - Area	33.1	sf
16 Retained Soil High 4+ Courses	1	Count
17 Cap Spalling Low 10-30%	1	Count

Figure 16. Distress Legend for the brick wall panel in Figure 15 (P1-201).

3.6 Grading/FCI

In order to prioritize repairs, each panel was assigned a grade or facility condition index (FCI). Since some types of distress are more structurally and functionally significant than others, different distress types were given different weighting in the grading system. For example, severe panel sagging was more heavily weighted than efflorescence.

In order to provide quantitative grades, the distress data (both severity and quantity) for each panel was exported into a spreadsheet (Figure 17). The totals of each type of distress were then grouped into a line for each panel.

	A	B	C	D	E	F	G	H
54	6	1	A	P1-006	13 Cleanin	0.5	sf	
55	6	1	A	P1-006	14 Retaine	1	Count	
56	6	1	A	P1-006	18 Cap Spa	1	Count	
57	7	1	A	P1-007	02 Sag Par	1	Count	
58	7	1	A	P1-007	07 Crack -	4.45	ft' in"	
59	7	1	A	P1-007	07 Crack -	3.061	ft' in"	
60	7	1	A	P1-007	09 Columr	1	Count	
61	7	1	A	P1-007	10 Cap Sol	1	Count	
62	7	1	A	P1-007	12 Efflores	0.2	sf	
63	7	1	A	P1-007	13 Cleanin	6	sf	
64	7	1	A	P1-007	14 Retaine	1	Count	
65	7	1	A	P1-007	17 Cap Spa	1	Count	
66	8	1	A	P1-008	01 Crack P	1	Count	
67	8	1	A	P1-008	07 Crack -	7.202	ft' in"	
68	8	1	A	P1-008	07 Crack -	1.817	ft' in"	
69	8	1	A	P1-008	07 Crack -	2.67	ft' in"	
70	8	1	A	P1-008	07 Crack -	0.474	ft' in"	
71	8	1	A	P1-008	07 Crack -	0.616	ft' in"	
72	8	1	A	P1-008	09 Columr	1	Count	
73	8	1	A	P1-008	10 Cap Sol	1	Count	
74	8	1	A	P1-008	13 Cleanin	1.9	sf	
75	8	1	A	P1-008	13 Cleanin	1.4	sf	
76	8	1	A	P1-008	15 Retaine	1	Count	
77	9	1	A	P1-009	02 Sag Par	1	Count	
78	9	1	A	P1-009	07 Crack -	2.347	ft' in"	
79	9	1	A	P1-009	09 Columr	1	Count	
80	9	1	A	P1-009	13 Cleanin	0.2	sf	
81	9	1	A	P1-009	13 Cleanin	0.5	sf	
82	9	1	A	P1-009	13 Cleanin	2.3	sf	
83	9	1	A	P1-009	13 Cleanin	9.4	sf	

Park Meadows Data Export9

Figure 17. An example of distress data from several Phase 1 panels exported to a spreadsheet format.

Based on the weighting system agreed upon by the stakeholders, each type of distress was multiplied by a weighting factor (Figure 18). An example of a distress weighting is moderate panel sagging, which had a weight of 22 "points". Each type of distress on a panel would be multiplied by the weight, and a total number of distress "points" would be calculated for a given panel. A higher number of "points" would indicate a higher level of distress for a panel. It was determined that the worst possible condition (a panel with the maximum amount and severity of every type of distress) would result in a grade of 97 points. Therefore, the point totals for each panel were normalized by dividing each panel's point total by 97. This yields a panel index that is a percentage of the worst possible panel considered.

However, grading scales (especially in an academic context) generally are provided as a percentage of the *best*, rather than the *worst*, possible outcome. Therefore, the percentages were subtracted from 100%, so that a higher percentage represented a panel with less distress.

V	W	X	Y	Z	AA	AB	AC	AD	AE
				Low Value	Low Value	Low Value	Low Value		
				0.5	1.1	5	1		
				Low FCI	Low FCI	Low FCI	Low FCI		
				2	3	2	1		
				Medium FCI	Medium FCI	Medium FCI	Medium FCI		
				7	6	5	4		
				High Value	High Value	High Value	High Value		
				3	4	30	10		
				High FCI	High FCI	High FCI	High FCI		
10	22	35	9	9	8	7	6	3	2
FCI Grade per Distress									
01 Crack Panel Sagging	02 Sag Panel Sagging	03 Collapse Panel Sagging	04 Column Pop-Up	05 Corroding r.f. - Length	06 Missing Brick	07 Crack - Length	08 Panel Brick Spalling - Area	09 Column Spalling Beneath Cap - Count	10 Cap Solid Exp Joint
10	22	35	9	9	8	7	6	3	2
		35	9	9	8	7	6	3	2
						5		3	2
					3	5			
10						2		3	2
						7			
						5		3	2
10					6	5		3	
	22					5		3	2

Figure 18. Portion of the spreadsheet used to calculate grades for each panel showing several types of distress and the associated weights at the top. The bottom portion (white in color) of the table shows example points for several panels (one panel per line).

While the percentage grades are useful as a relative measure, it was determined that it would be more meaningful for these grades to be divided into groups. There is not any particular percentage grade that was predetermined to constitute a "good" or "bad" panel. Continuing the academic grade analogy, the panel grades were divided into five approximately equal groups (Figure 19). The top 20th percentile (i.e., the panels with the least distress) were assigned a letter grade of "A". The next 20th percentile was given a letter grade of "B", and so on, with the 20% of panels having the most significant distress assigned "F's".

As described in a later section of this report, the letter grades are useful in providing a visual summary of the locations of the most severely distressed panels, which can assist with prioritization of repairs.

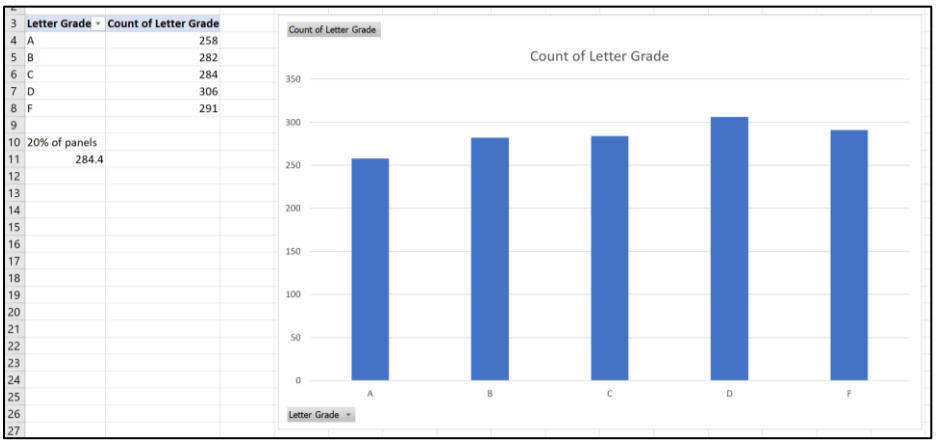


Figure 19. Bar graph showing the distribution of panels in each letter grade. Grade ranges were selected such that each letter grade represents approximately 20% of the total panels.

4.0 Observations

4.1 Distress Types

Over the course of the ANA observations, a limited number of different types of distress were observed. Some types of distress included different severities (such as sagging), and some types of distress displayed different quantities (such as missing brick). ANA attempted to document not only the presence or absence of distress at each panel, but also the location, severity, and quantity of distress, where relevant.

A summary of the types of distress observed is provided in Table 1. For each distress type, the measurement of the distress and the categories of distress are listed. For example, the number of missing bricks at a panel can be readily counted, so the measurement of this type of distress is simply a count. Similarly, an expansion joint at the wall cap is either correctly or incorrectly constructed, so the Cap Solid Expansion Joint distress is generally a count of one or zero per panel. Other types of distress, such as Cracking are more readily measured as a length (in feet), while other types of distress (such as Efflorescence) can be measured in area (square feet).

In order to quantify the severity of a type of distress, many distress types were broken into 3 categories or levels of distress. For example, the most severe type of panel sagging, involving the bottom courses of the panel falling to the ground and opening up large cracks, was referred to as "Collapse Panel Sagging". A moderate level of sagging, where cracks have opened somewhat was referred to as "Sag Panel Sagging", and a minor level of sagging where only cracking is visible was referred to as "Crack Panel Sagging". A similar approach is used with most distress that can have variable quantities or severity. For example, a total crack length per panel of over 30 feet was considered "severe", between 5 and 30 feet "moderate", and less than 5 feet "minor". These groups or ranges of distress assist with the calculation of grades.

Table 1. Summary of observed distress type with measurement and levels.

#	Distress	Measurement	Level or Category
1	Panel Sagging	Count	Minor (Crack Panel Sagging), Moderate (Sag Panel Sagging), Severe (Collapse Panel Sagging)
2	Column Pop-Up	Count	
3	Corroding Reinforcing	Length (ft)	Minor (<6"), Moderate (6"-3'-0"), Severe (>3'-0")
4	Missing Brick	Count	Minor (1), Moderate (2-3), Severe (>3)
5	Crack	Length (ft)	Minor (<5'-0"), Moderate (5'-0" – 30'-0"), Severe (>30'-0")
6	Panel Brick Spalling	Area (sq ft)	Minor (<1), Moderate (1-10), Severe (>10)
7	Column Spalling Beneath Cap	Count	
8	Cap Solid Expansion Joint	Count	
9	Panel Solid Expansion Joint	Count	
10	Efflorescence	Area (sq ft)	Minor (<3), Moderate (3-10), Severe (>10)
11	Cleaning	Area (sq ft)	Minor (<5), Moderate (5-15), Severe (>15)
12	Retained Soil	Count	Minor (0-1), Moderate (2-3), Severe (>3)
13	Cap Brick Spalling	Percentage	Minor (10-30%), Moderate (40-70%), Severe (80-100%)

The following sections provide descriptions and examples of each type of distress observed. The most prominent causes for each type of distress are also described.

4.1.1 Panel Sagging

The type of distress referred to as panel sagging generally includes separation of the bottom few courses of brick downward from the remainder of a panel. The most common sagging behavior involves cracks or openings that are relatively wide at the middle and narrow at each end of a panel. However, sagging has also been observed near ends of panels and at steps along the bottom edge. ANA divided panel sagging into three different levels of distress: crack panel sagging, sag panel sagging, and collapse panel sagging (in order from minor to severe distress). Examples of each level of distress are shown in Figure 20 through Figure 22.

There are several likely contributing causes of panel sagging distress. One contributing factor is related to how loads travel through the panels. In structures, loads travel primarily along the stiffest available path. In the case of the wall panels, this path is often in an arch shape between the foundation supports. However, the original design envisioned that the panel would behave as a beam that spans over the gap between foundation supports. The arching action behavior places much of the top and ends of the panels in compression (which is beneficial in masonry), but the bottom center portion of the panels may be left to "hang" from this arch. This behavior is demonstrated schematically in Figure 23. Since only minimal smooth wire is oriented vertically to help resist this hanging motion, the bottom portion of the panel is prone to breaking free and sagging downward under its own weight.

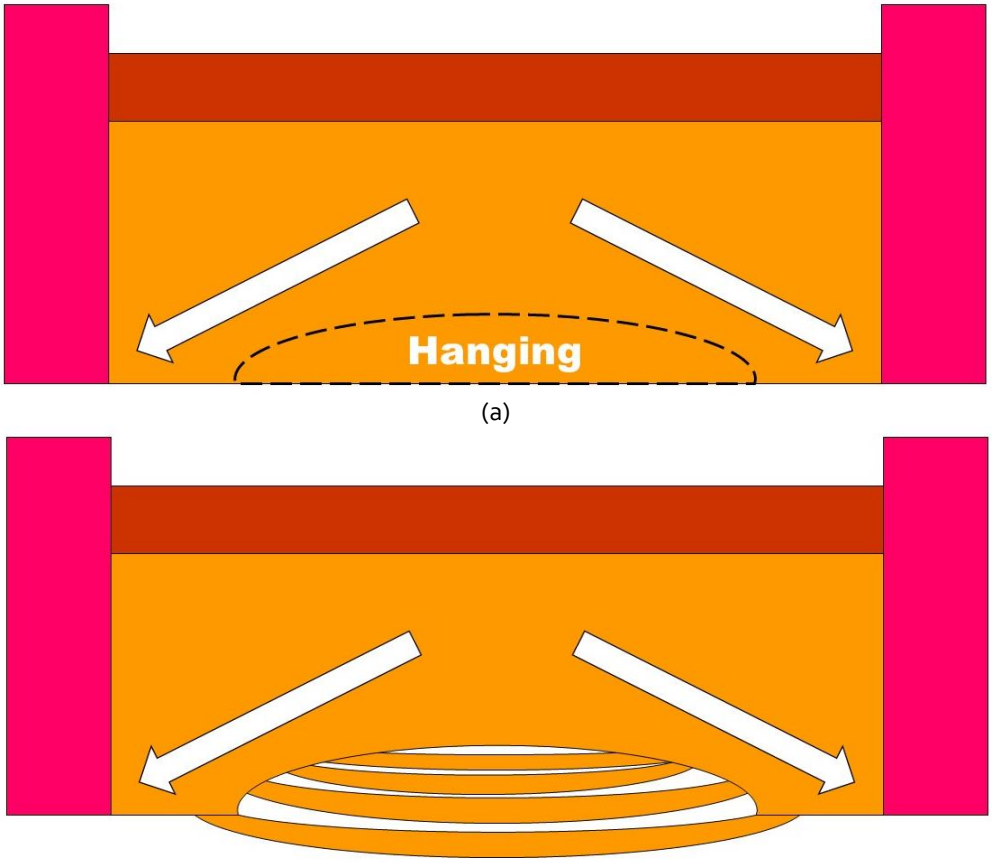
A second contributing factor to panel sagging is the manner in which the bottom course "bond beam" is constructed. Since the width of the bottom course of brick is only approximately 2 5/8" thick, there is not room for a conventional bond beam unit with horizontal reinforcing that is grouted in place. Therefore, the construction consisted of reinforcing that was placed into a narrow slot with some mortar. Not only is the strength and bond of this mortared reinforcing substantially less than grouted reinforcing, but the mortar also provides very poor cover or corrosion protection for the reinforcing bars. For these reasons and others, installation of reinforcement with mortar is not permitted by the Building Code in these circumstances. One of the consequences of poor cover of the "bond beam" reinforcement is that many reinforcing bars have begun to corrode. Corrosion of steel involves expansion that is also contributing to popping the bottom courses of panels free from the supporting panel above.

Finally, another significant contributor to panel sagging is likely the very flexible nature of the panels. The body of the brick walls is only approximately 2 13/16 inches thick, significantly less than a standard brick thickness of 3 5/8". The flexibility of the panels is apparent from the vibration felt whenever a panel is knocked on with a fist or foot. This flexibility also makes the panels susceptible to damage from minor impacts such as lawn mowers or shovels striking along the bottom edge.

Figure 20. Example of "Crack Panel Sagging" distress, the minor category of panel sagging.

Figure 21. Example of "Sag Panel Sagging" distress, the moderate category of panel sagging.

Figure 22. Example of "Collapse Panel Sagging" distress, the severe category of panel sagging.



(a)

(b)

Figure 23. Schematic diagram of arching action of panel between foundation supports that contributes to panel sagging (a) showing the load arching diagonally to the foundation supports with the middle bottom portion of the

panel "hanging" from the arch above (b) showing failure and sagging of the bottom middle portion of the panels. Movements are exaggerated for clarity.

4.1.2 Column Pop-Up

There are several types of behavior that are related to expansion joint conditions at the brick walls. Much like concrete shrinks over time, clay brick expands over time. Therefore, expansion joints are required that allow this expansion to occur without damaging the wall. There was some consideration for expansion in the original design of the walls. Half of the columns have a pocketed expansion joint on both sides (Figure 24). Since the cap is wider than the panel, the vertical joint between the cap and the column must be left open (or filled with a soft, compressible material) in order to accommodate panel expansion. Even if the expansion joints were installed in perfect accordance with the design drawings, the spacing of expansion joints would generally be around 45 feet on-center, which is a dramatically wider spacing than the maximum of 25 feet industry standard, and standard publications recommend that this spacing be further reduced for walls that are exposed on both sides.

There are several common construction issues related to expansion joint installation at the subject walls. The most common issue is that the open joint required between the cap and column at the expansion joint location is often filled with mortar or is constructed without any gap. Where this condition is present, the brick panels expand, and the body of the panels is permitted to slide into the slotted expansion joint within the column. However, the cap pushes on the column and has no room to expand. Since this pushing is generally happening from both sides, the caps tend to crack horizontally and buckle upward, sometimes bringing the top of the column along with them, as shown schematically in Figure 25. Examples of the column pop-up behavior are shown in Figure 26 and Figure 27.

Since the root cause of this distress is solid expansion joints in wall caps, the solid expansion joint itself was documented as a distress condition ("Cap Solid Expansion Joint"). The horizontal cracking and buckling of the caps may also occur without lifting the tops of columns, and this distress was traced as "Cracking", and will be discussed in a subsequent section. Additionally, the slotted expansion joints along the height of the panel (beneath the caps) are intended to be free of mortar, as shown in the design detail, to permit free expansion of the panels. This joint was sometimes mortared solid, and this condition was documented as "Panel Solid Expansion Joint".

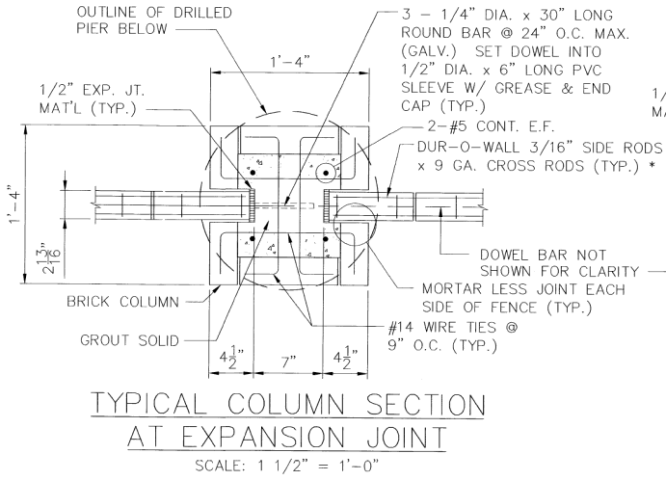


Figure 24. Detail from original design drawings showing the design of expansion joints on both sides of a column.

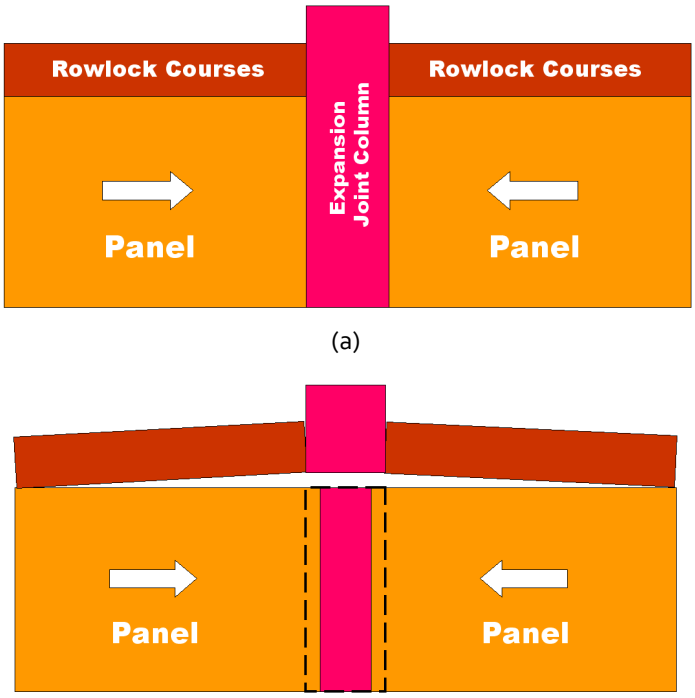


Figure 25. Schematic diagrams of panel behavior at expansion joints with top portion full of mortar leading to column pop-up (a) the original configuration and direction of panel expansion and (b) the displaced configuration if the expansion joints at the base of panels are effective and the rowlock courses cannot accommodate movement. Movement is exaggerated for clarity.

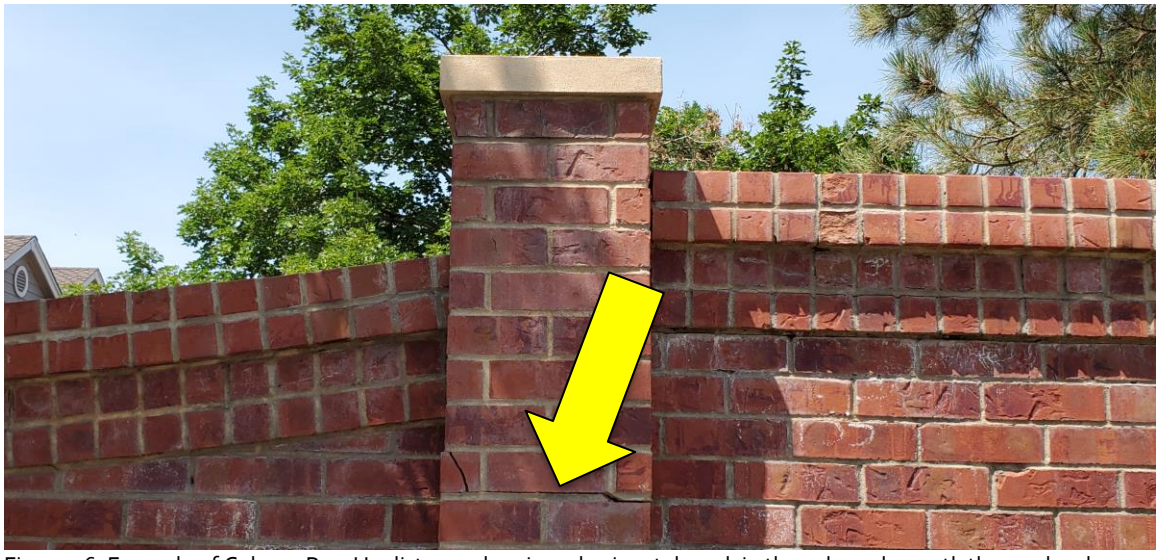


Figure 26. Example of Column Pop-Up distress, showing a horizontal crack in the column beneath the cap level, indicated with arrow.

Figure 27. Example of Column Pop-Up distress with the cap buckling slightly higher on the right side.

4.1.3 Corroding Reinforcing

There is steel reinforcing present in both the bed (horizontal) mortar joints of the wall panels and in the bond beams at the base of the panels. Both types of reinforcing are embedded in mortar and have little cover (corrosion protection) due to the very thin nature of the panels. This poor protection, along with salt spray from adjacent roadways and moisture issues contribute to the observed corrosion of reinforcing. An example of bed joint reinforcing corrosion is shown in Figure 28, and an example of bond beam reinforcement corrosion is shown in Figure 29.

Figure 28. An example of corroding bed joint reinforcing.

Figure 29. Example of corroded reinforcing bar in bond beam at the bottom of a panel.

4.1.4 Missing Brick

At some locations, brick units were observed to be missing from the wall panels. The loose units had sometimes been set on top of the panels or had fallen to the ground near the panel. In many cases, the missing units were not visible near the wall panel. Generally, missing units were concentrated at wall caps and tended to be associated with horizontal cracking and solid cap expansion joint conditions that caused the cap to buckle. An example of a missing brick unit is shown in Figure 30. Bricks that were significantly deteriorated, usually with more than about 20% of material loss were also marked as missing since these units would require replacement as part of a repair scheme.

Figure 30. Example of a missing brick unit at a wall cap.

4.1.5 Crack

As discussed in the section above related to Column Pop-Up, caps with solid expansion joints tended to cause buckling of the caps as the brick expands. This behavior can lead to extensive horizontal cracking, generally concentrated in or near the caps. This cracking is sometimes exacerbated by a step-down in the cap at panels where the ground slopes along the length of the wall, as shown schematically in Figure 31. An example of cracking in a panel is shown in Figure 32.

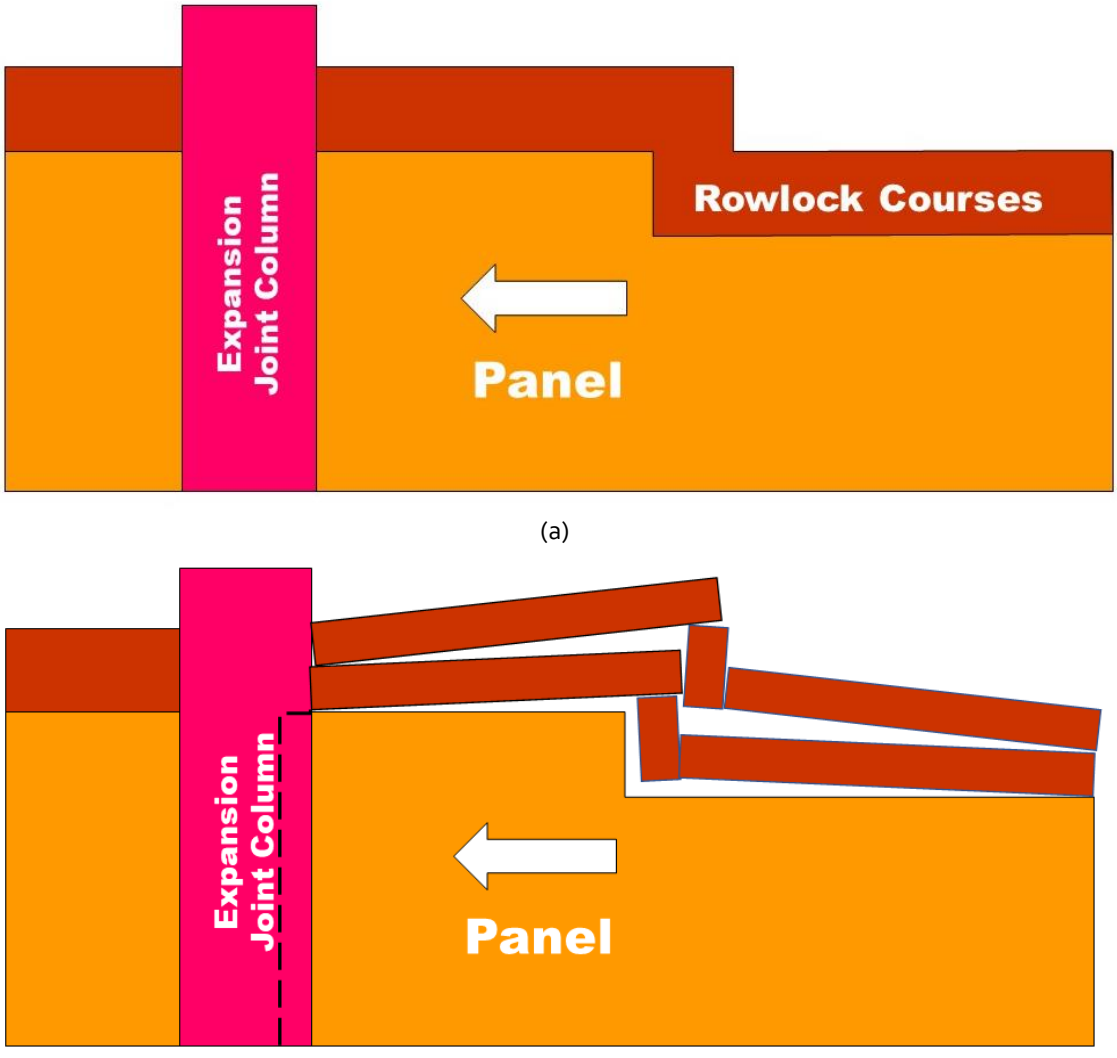


Figure 31. Schematic diagrams of panel behavior at expansion joints with top portion full of mortar leading to horizontal cracks (a) the original configuration and direction of panel expansion and (b) the displaced configuration if the expansion joints at the base of panels are effective and the rowlock courses cannot accommodate movement. Movement is exaggerated for clarity.

Figure 32. An example of horizontal cracking in and near a cap that is buckling due to expansion that is not accommodated with an open joint at the level of the cap.

4.1.6 Panel Brick Spalling

Spalling or surface loss of brick at the subject panels is related to several contributing factors. One factor is that brick was used on the project that does not meet modern ASTM material standards for absorption and saturation coefficient. These properties are improved when brick is properly fired to a high temperature. It is cheaper to manufacture brick that are not properly fired since it requires less fuel for the firing kilns.

The other primary contributing factor to the observed panel spalling is moisture management. Spalling in this climate is most frequently related to cycles of freezing and thawing while the masonry is in a saturated or wet condition. Freezing and thawing cycles have no deleterious effect on masonry that is dry. In the case of spalling within the body of wall panels, the most common cause of wet panel conditions was retained soil. Since soil will tend to hold and absorb water and snow melt, the presence of soil in direct contact with wall panels can tend to keep these panel wet during freeze-thaw cycles. An example of panel spalling distress is shown in Figure 33.

Figure 33. An example of panel spalling distress, likely related to retained soil on the opposide side of the wall.

4.1.7 Column Spalling Beneath Cap

There were several areas of spalling that were so common that they were separated into separate categories of distress. One very common location of spalling was at the top of columns beneath the precast caps. An example of spalling beneath a column cap is shown in Figure 34.

Figure 34. An example of brick spalling beneath a column cap.

There are a couple of likely reasons for concentration of moisture and spalling at these locations. First, the columns extend up beyond the tops of the flat panel caps so that moisture and snow perched on top of the panel caps will tend to be in contact with the tops of the columns at both ends. Additionally, the precast concrete caps did not include drip edges at the perimeter. Without a drip edge, much of the

water and snow melt on top of the cap tends to wrap around bottom edge of the cap and contact the brick masonry below. No drip edge was called for in the caps as part of the original design.

4.1.8 Cap Solid Expansion Joint

As discussed in previous sections, one of the primary causes of distress such as Column Pop-Up and Cracking is the presence of solid expansion joints at wall caps. Since this condition is responsible for various types of damage, it was tracked by ANA as a separate type of distress. Figure 35 shows both a solid cap expansion joint (that tends to cause damage) and an open cap joint (that permits brick expansion without damage). Solid cap joints were observed at the vast majority of expansion joint locations.

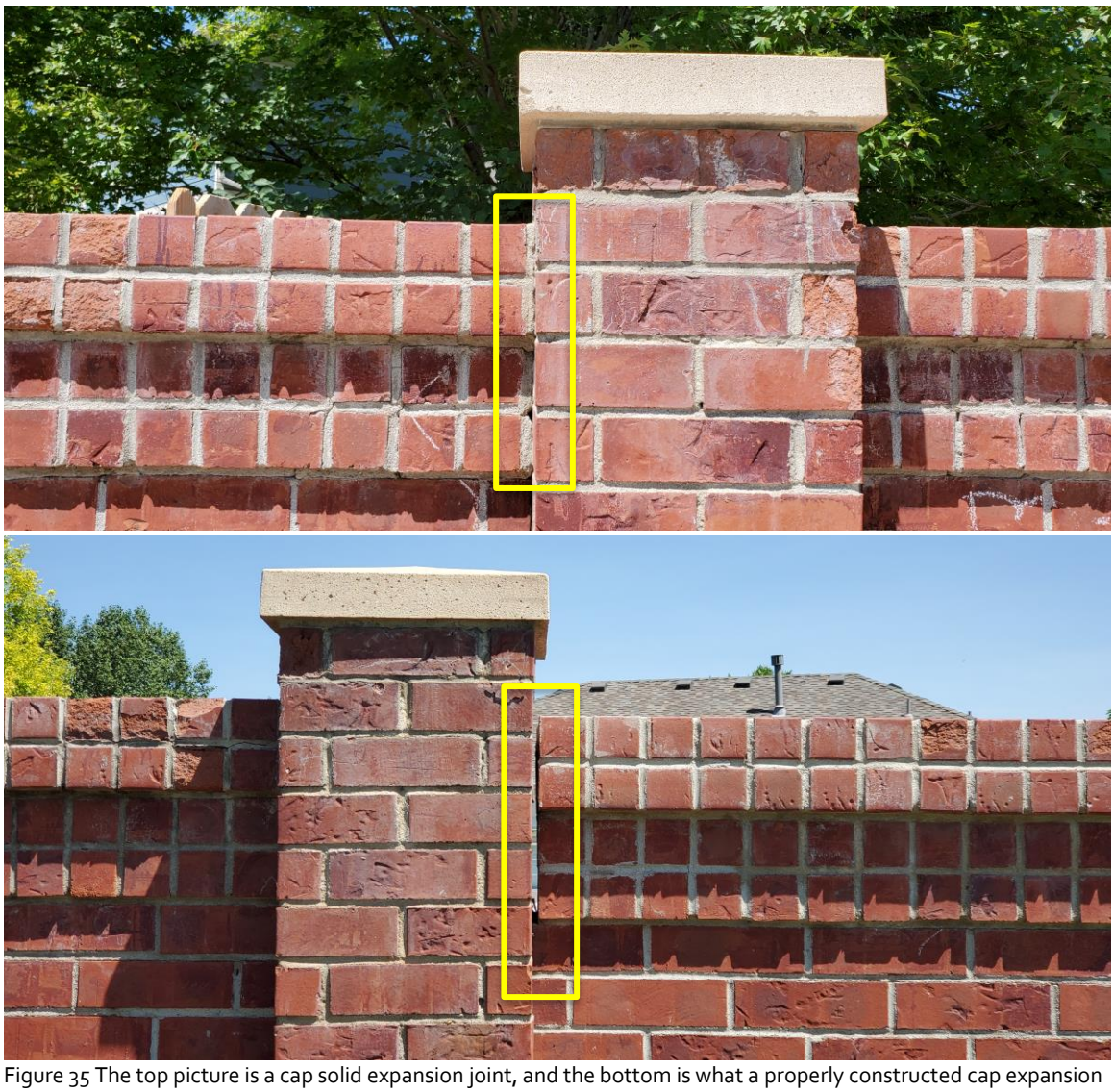


Figure 35 The top picture is a cap solid expansion joint, and the bottom is what a properly constructed cap expansion joint looks like. Note the light visible through the open joint.

4.1.9 Panel Solid Expansion Joint

Similar to solid cap expansion joints, ANA also observed expansion joints in panels that were mortared solid, rather than left open. These conditions were documented as Panel Solid Expansion Joints. However, this condition tended to result in less distress in the surrounding panels. This is likely because the force of expansion in the panels could readily crack the full joints in shear in most cases so that the expansion was not as restricted. Examples of a panel solid expansion joint and a properly constructed joint are shown in Figure 36.

Figure 36 On the left is a panel solid expansion joint, and the photograph on the right shows a properly constructed panel expansion joint.

4.1.10 Efflorescence

Much like freeze-thaw spalling, efflorescence in masonry is related to excessive moisture. The white surface deposits are naturally occurring salts or lime that is leached out of the masonry when saturated and deposited on the surface as the water evaporates off. An example of efflorescence is shown in Figure 37. These wet conditions often appear to be related to retained soil, drainage, or irrigation conditions.

Figure 37. An example of efflorescence at a column.

4.1.11 Cleaning

Areas marked by ANA as requiring cleaning were generally related to mortar deposits left from original construction or previous repair campaigns. There were some instances of graffiti and other surface deposits. An example of an area that was marked for cleaning is shown in Figure 38.

Figure 38. An example of mortar staining that was marked by ANA as an area for cleaning.

4.1.12 Retained Soil

As discussed in previous sections, one reason for excessive moisture and associated spalling and efflorescence near the base of some wall panels was retained soil in direct contact with the masonry. The effects of this moisture are exacerbated by the substandard brick materials used at the subject walls. In a few instances, retained soil had caused visible bowing or outward failure of wall panels at the base.

Generally, retained soil resulted in an increased amount of spalling, efflorescence, and staining at panels where retained soil was present. There are a series of panels in Phase 1 that were reportedly designed to have retained soil on one side. Therefore, the retained soil at these locations was not noted as distress. However, any associated spalling, efflorescence, or staining was still recorded. An example of a wall panel with significant retained soil is shown in Figure 39 and Figure 40.

Figure 39. An example of a panel with significant retained soil viewed from the yard side. Approximately 15 courses of brick are visible in the panel above grade.

Figure 40. An example of a panel with significant retained soil viewed from the street side. Approximately 23 courses of brick are visible in the panel above grade (i.e. the soil on the back side is approximately 8 courses or 2 feet higher than the front).

4.1.13 Cap Brick Spalling

Spalling along the top two courses of the panel caps was prevalent throughout the study area. It was decided that the spalling occurring at the cap would be documented as a separate type of distress than spalling beneath column caps or in the body of a panel. Counting the number of spalled units in each cap

was not practical, so estimates (to the nearest 10%) of spalling were provided for each panel cap. Examples of mild, moderate, and severe levels of cap spalling are provided in Figure 41, Figure 42, and Figure 43, respectively.

Since cap spalling is related to moisture and snow perching on top of the cap and undergoing freeze-thaw cycles, it was interesting to note that portions of caps with significant tree cover (especially evergreen tree cover) tended to have much lower levels of spalling than exposed areas, even along the same panel.

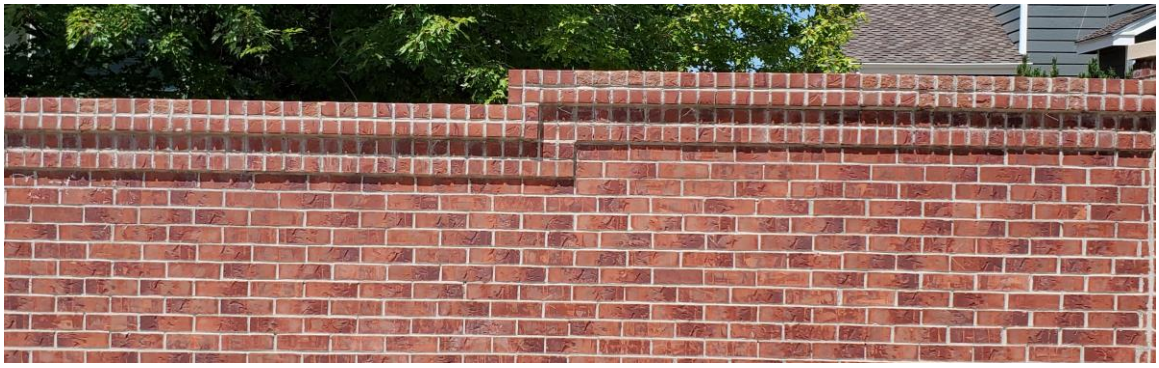


Figure 41. An example of a cap with less than 30% spalled units.

Figure 42. An example of a cap with 40% to 70% spalled units.

Figure 43. An example of a cap with 80% to 100% spalled units.

4.2 Drawings

As described previously, all 1422 panels that were part of the scope of this study were photographed, these photographs were rectified and scaled to use as background drawings, and the distress on each panel was included in drawings. These drawings are attached to this report. This section describes the symbols and annotations used to document each type of distress. This section can be used as a guide for interpretation of the attached drawings. Note that each page of drawings also includes a legend that identifies each symbol used on that sheet. In this section, Panels P1-151, P2-214, P3-013, and P4-011 are used as examples. In the figures below, a close-up image of each symbol or mark is provided on the left side of the figure, and its location on a sample panel is shown on the right. The subject symbol is circled in white. There is also a rectangular image beneath that demonstrates how this item is displayed in the distress legend on each drawing page, when present. The caption for each figure describes the symbol and type of distress noted for each item.

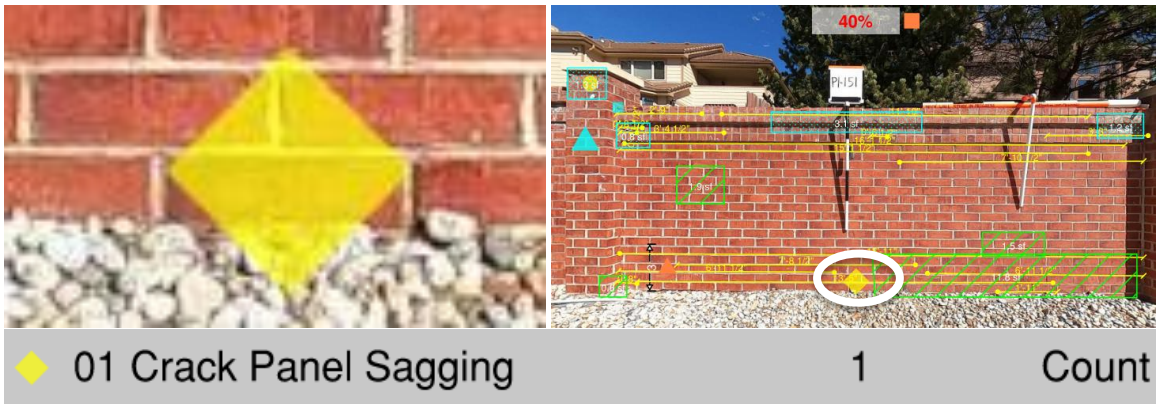


Figure 44. A diamond of yellow color indicates cracked panel sagging, which is the lowest of the three levels of sagging (minor). There are also orange and red diamonds. Orange represents sag panel sagging (moderate) and red represents collapse panel sagging (severe). These symbols are usually found toward the bottom of panel where the sagging is located on the panel. The cracks are marked as a Crack type of distress for minor sagging only since repointing moderate or severe cracking without reconstruction is not practical. In the legend, sagging is measured as a count, indicating that there is a certain type of sag or crack on the bottom of the panel (either one or zero sagging marks per panel).

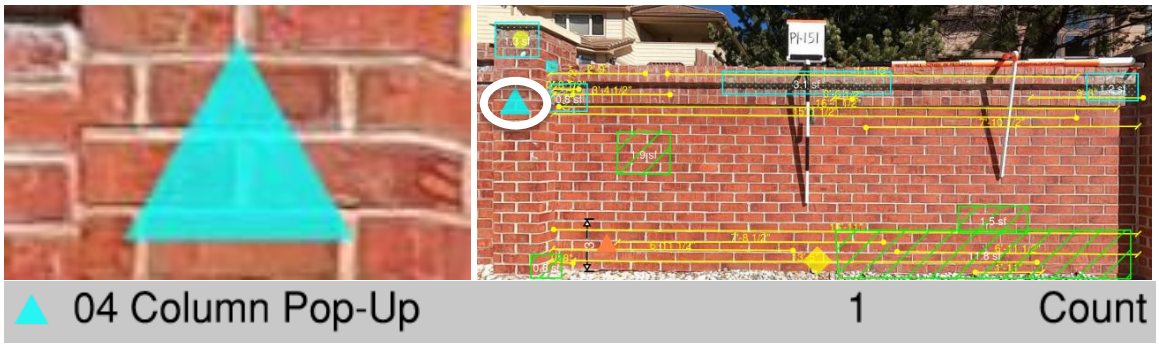


Figure 45. A large blue triangle represents a column pop-up. This indicates that at the top of the column there is either a large crack going through the entire column, or the column top is visibly separated from the rest of the column. The triangle will be found on the left side column toward the top of the column. In the legend it will show up as a one count for each panel that has this type of distress.

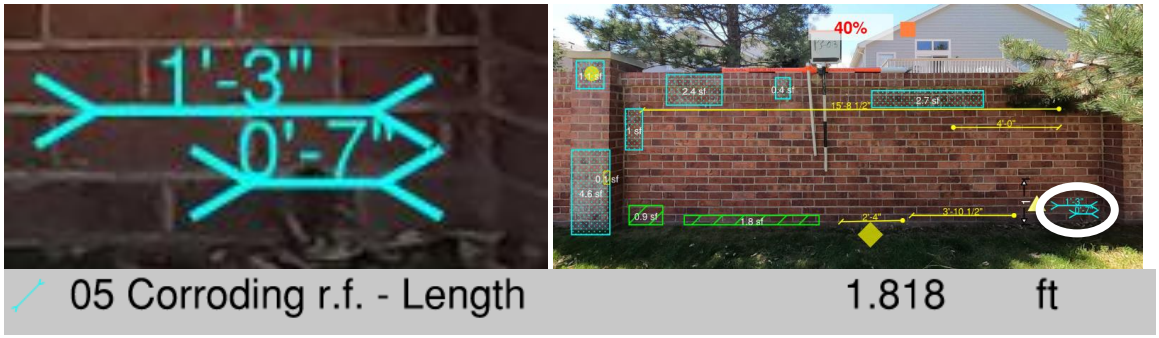


Figure 46. The blue lines represent corroding reinforcement within the panel. There is both bed joint reinforcing at each course of brick in the panels studied and a bond beam at the base of the panel. Corrosion can be found anywhere on the wall but is often in the lower courses. In the picture, the corroding reinforcements shows up as a linear measurement of feet and inches. The length showed in the legend will be the sum of all of the lengths of corroding reinforcing for the panel.

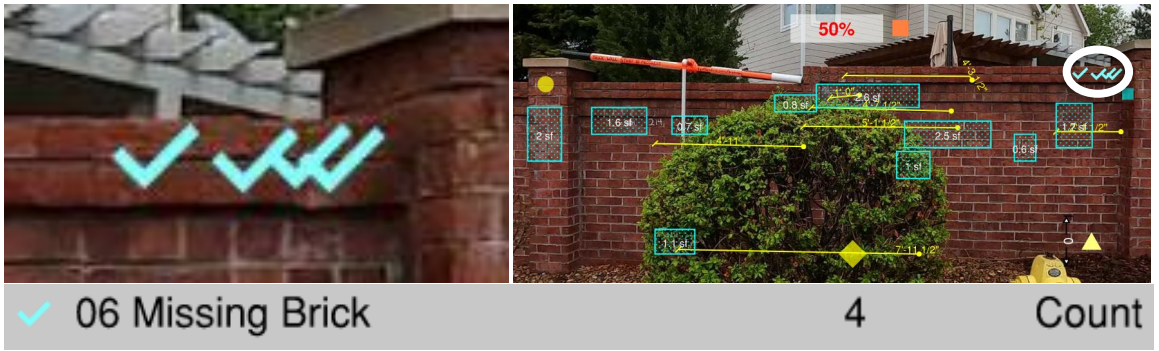


Figure 47. Missing bricks are indicated by blue checkmarks at the location where the units are missing on a panel. These can be found anywhere on the panel, but in most cases, missing units were observed on the top of the panel (within the cap) or at the very bottom of the panel. Units that were eroded to the point of significant material loss were also marked as "missing" since they would require replacement as a repair. Each checkmark is considered one count, which is shown in the legend. In this case there are four checkmarks and, therefore, four missing bricks.

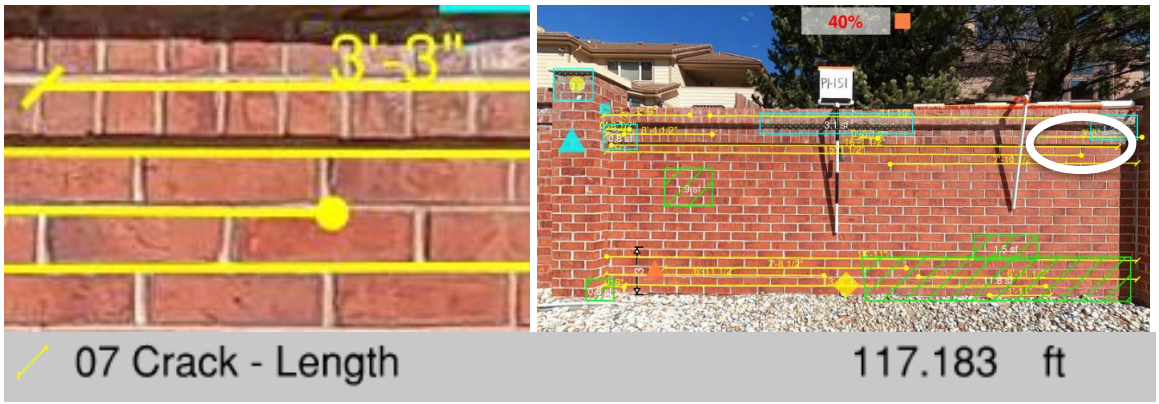


Figure 48. Crack length is indicated with a yellow line that represents vertical or horizontal cracking on the panel. Cracking can be found anywhere on the panel and was marked on the bottom where crack panel sagging has been identified. Horizontal cracking near the top of the panel was the most commonly observed location. Horizontal cracking in general was much more common than vertical cracking. In the legend, this distress is displayed as a length in feet with sum of the total length of cracking on the panel.

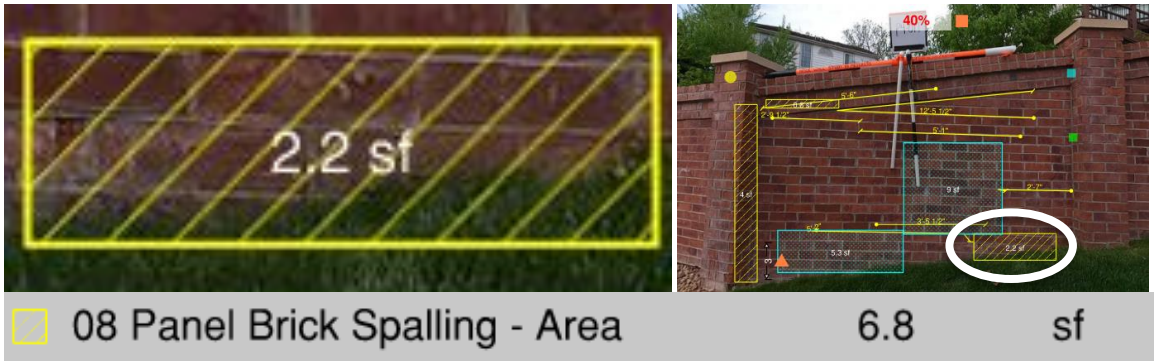


Figure 49. Panel spalling is represented by a yellow rectangle with a diagonal hatch. This distress can be found anywhere on the panel, but it is most commonly found toward the bottom of the panel, as shown in the picture above. The unit of measurement is square feet of area. In the legend, the total area in square feet of all the panel spalling areas added together is displayed.

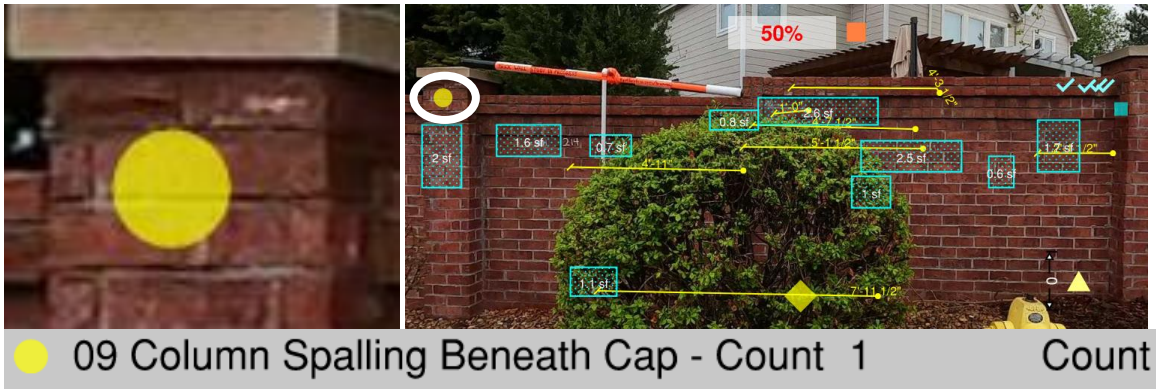


Figure 50. Column Spalling beneath cap is represented by a yellow circle that is found toward the top of the column. This type of spalling is distinguished from panel spalling because it was so commonly observed that it was given a separate designation. Spalling lower on the column would be considered panel spalling. In the legend, this distress is measured as one count.

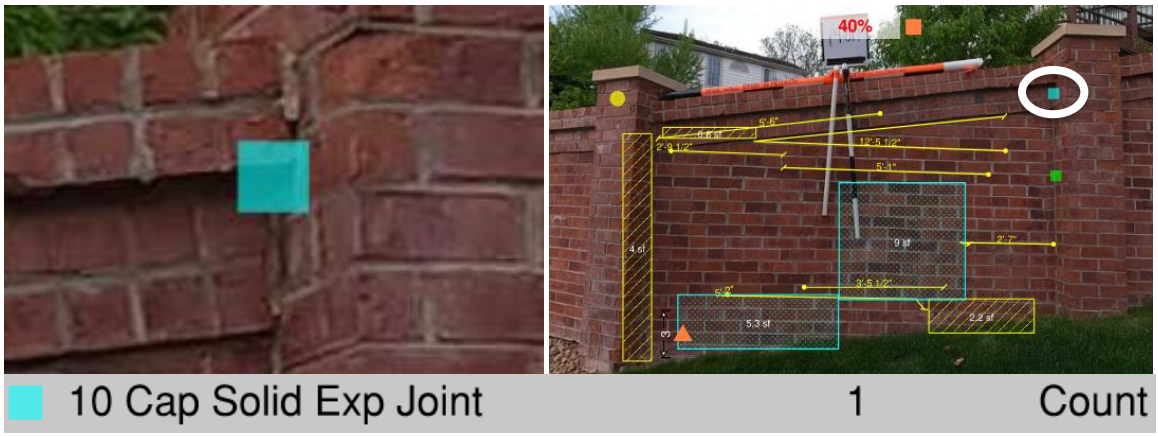


Figure 51. A small blue square represents a cap solid expansion joint. This is found at the top of the column where the cap of the panel intersects the column, either on the left or right side of the panel. At this distress condition, the expansion joint was filled in at the cap (top four courses of brick), not allowing for this portion of the wall to expand freely. In the legend, this distress is measured as a one count.

Figure 52. A small green square represents a panel solid expansion joint. It is found where the column and panel meet and can either be marked on the left or right side of the panel. It is marked where the expansion joint within the panel (beneath the top four courses) is filled solid with mortar, rather than left open to permit movement due to brick expansion. In the legend, it is measured as a one count.

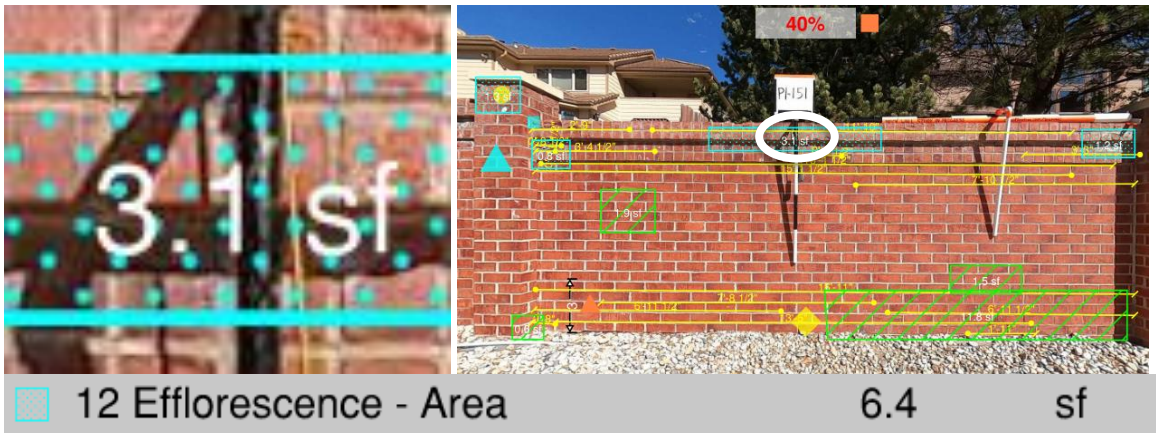


Figure 53. Efflorescence is represented by a stippled blue box and can be found anywhere on the panel or column. It is measured in square feet of area, and each panel can have multiple markings for efflorescence. In the legend, the value is displayed as the total area in square feet for all efflorescence areas.

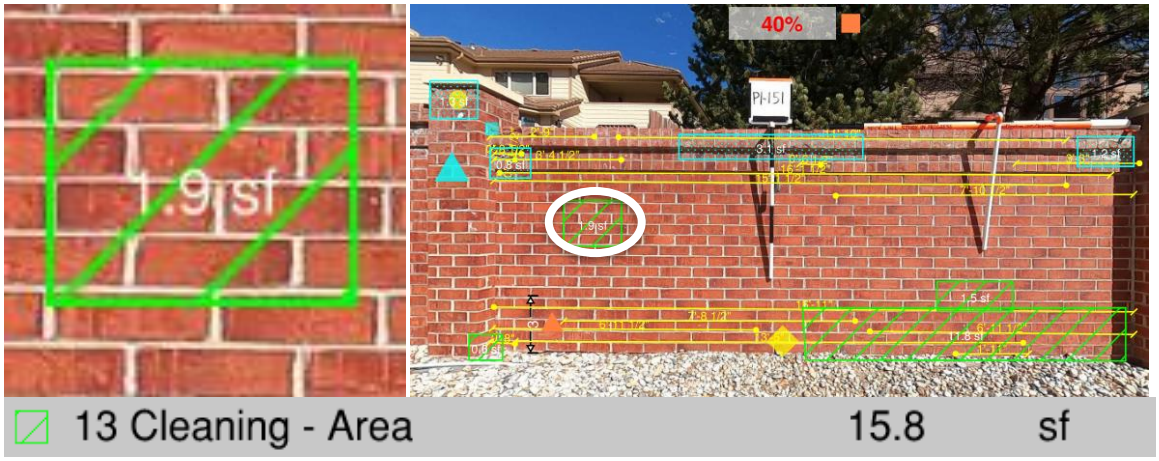


Figure 54. Cleaning is represented by a diagonally hatched green box and can be found anywhere on the panel or column. It is measured in square feet of area, and each panel can have multiple markings for cleaning. This distress included mortar splatter and various other kinds of surface staining. In the legend, the value is displayed as the total area in square feet for all cleaning areas.

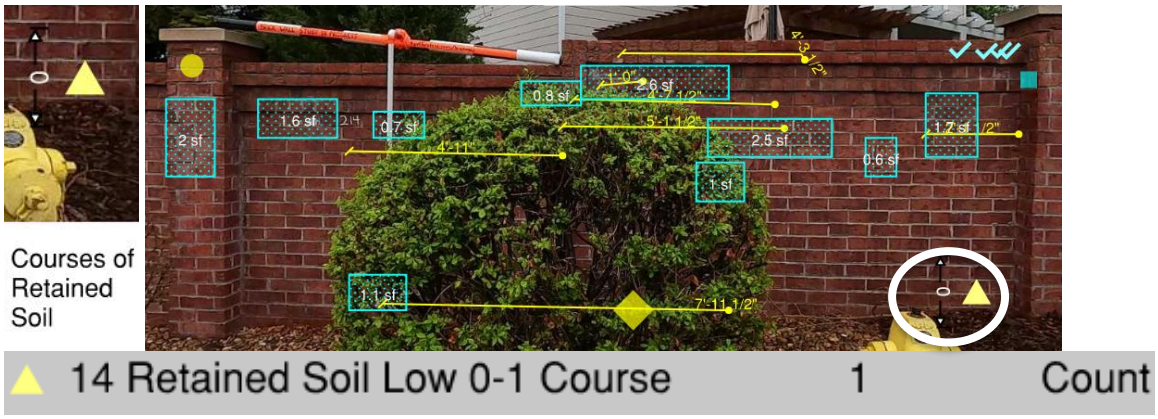


Figure 55. Minor retained soil is represented by a yellow triangle which mean that there are between zero and one course of retained soil. The symbol will appear next to the number of courses of retained soil at the bottom of the panel. It will also be directly above the "Courses of Retained Soil" text. The triangle can also be orange and red. The orange triangle indicates moderate retained soil, which is from two to three courses retained. The red represents severe retained soil, which is anything over four courses retained. In the legend, retained soil is measured as a one count for either minor, moderate, or severe retained soil condition, if present. Note that the height of the dimension mark does not represent the height of the retained soil.

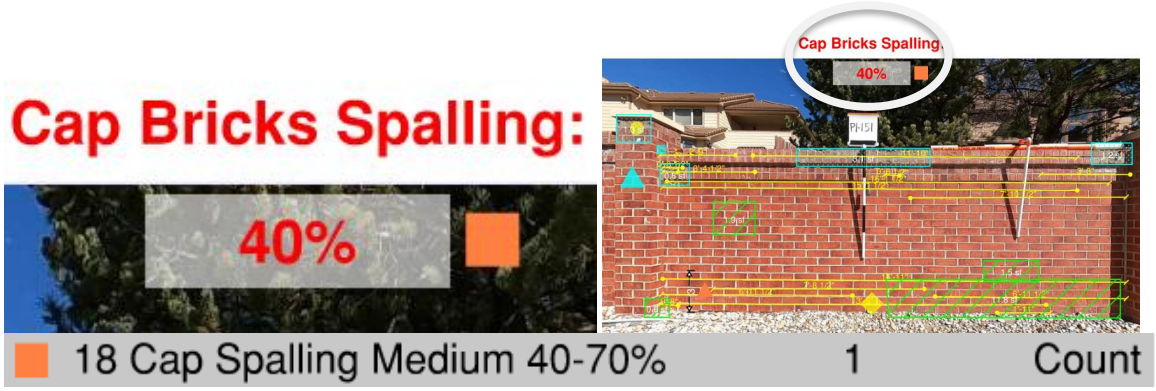


Figure 56. Moderate cap spalling is represented by an orange square for cap spalling from 40% to 70%. The symbol is located to the right of the cap spalling percentage. Spalling at the cap may also be indicated with a yellow or a red square. The yellow represents minor cap spalling from 10% to 30% and the red represents severe cap spalling of 80% to 100%. All spalling percentages are estimated to the nearest 10%. In the legend, cap spalling is measured as a one count for either minor, moderate, or severe spalling condition, if present.

5.0 Findings

5.1 Grades/FCI

As discussed previously, weighted values for each type of distress were multiplied by the quantities of distress at each panel to provide a numeric grade for each panel. The grades were divided into five equal portions of 20 percentile each. The panels in the best condition relative to the overall study area (top 20th percentile) were assigned a letter grade of "A", similar to an academic grade. The next 20th percentile of panels was assigned a grade of "B" and so on, with the bottom 20th percentile receiving a grade of "F".

The weighting of distress was modified with input from the project stakeholders. A particularly heavy weighting was applied to the collapse panel sag condition since this type of distress was deemed to both compromised the function and structural integrity of the panel. This type of distress is also very unsightly and could pose a safety concern. As a result of the heavy weighting of this condition, all panels with collapse panel sagging received grades in the bottom 20th percentile (a letter grade of "F").

After compiling the grades, several types of statistical analysis were performed in order to examine trends in both individual types of distress and in overall grades. In order to evaluate the overall condition of each phase, the average grade per phase was calculated, as shown in Table 2. It is notable that Phase 1 conditions appear to be slightly worse on average while Phase 5 conditions are slightly better. This is understandable since Phase 1 was the first phase constructed (and, therefore, the oldest phase), while Phase 5 has the most recently constructed panels. However, the average conditions do not vary dramatically between phases. For example, the distress is not concentrated entirely in one or two phases.

Table 2. Average numerical and letter grade for each phase of brick wall.

Average Grade by Phase		
Phase	Percent	Letter
1	66%	D
2	71%	C
3	72%	C
4	71%	C
5	75%	B

The percentages of panels affected by various types of distress are listed in Table 3. Among the more notable results are the following:

- 67% of the panels in the study had some level of sagging. This includes 32% of panels with moderate sagging (cracking that has opened up) and 9% of panels with severe sagging.
- 96% of panels have at least one crack.
- 79% of panels have at least some efflorescence.
- 79% of panels have at least one area that requires cleaning.
- 33% of panels have more than one course of retained soil at the base.

Table 3. Summary of statistical analysis of various types of distress, including percentage of panels affected and average values per panel.

Distress Type	Percent of Panels Effected	Average Distress Value per panel	Unit of Average Distress
Sagging			
01 Crack	25%		
02 Sag	32%		
03 Collapse	9%		
Total Sagging	67%		
Column Pop-up	3%	1	count

Distress Type	Percent of Panels Effected	Average Distress Value per panel	Unit of Average Distress
Corroding Reinforcement	11%	1.97	ft
Missing Brick	12%	2.71	count
Crack Length	96%	28.0	ft
Cap Solid EJ	54%	1.01	count
Panel Solid EJ	27%	1.01	count
Efflorescence	79%	10.8	sf
Cleaning	79%	16.3	sf
Retained Soil			
15 Med	26%		
16 High	7%		
Total Retained Soil	33%		

Spalling was prevalent throughout the studied panels. However, panels constructed with a soldier course along the top, rather than a wide, flat cap experienced dramatically less spalling, as shown in Table 4. 96% of panels with caps experienced some sort of visible spalling, including 84% with top of column spalling and 87% with cap spalling.

Table 4. Spalling comparison between typical panels and panels without caps.

Spalling In Main Sections (294 Panels)		Spalling in Panels without Caps (37 Panels)	
Panel	17%	Panel	3%
Column	84%	Column	0%
Cap: Minor	63%	Cap: Minor	0%
Cap: Moderate	18%	Cap: Moderate	0%
Cap: Severe	6%	Cap: Severe	0%
Total Cap	87%		
Total Spalling	96%	Total Spalling	3%

5.2 Heat Map

Another means of visualizing study results is by using color-coded "heat maps" to illustrate the locations of panels in various conditions. In order to prepare heat maps, each grade (or 20-percentile group) was assigned a color from green to red or a greyscale shade from white to black, as shown in Figure 57.

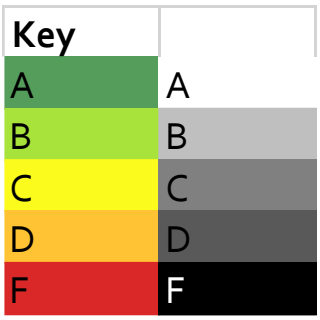


Figure 57. Color code for heat maps with color version on left and black and white version on the right.

When each panel is displayed as a narrow bar of color corresponding to its grade, it is possible to detect patterns of areas of relatively good conditions (concentrated green or white areas) and relatively poor conditions (concentrated red or black areas), as shown in Figure 58. Since the panel numbers are sequential based on location, these groups will also generally be in close proximity to one another.

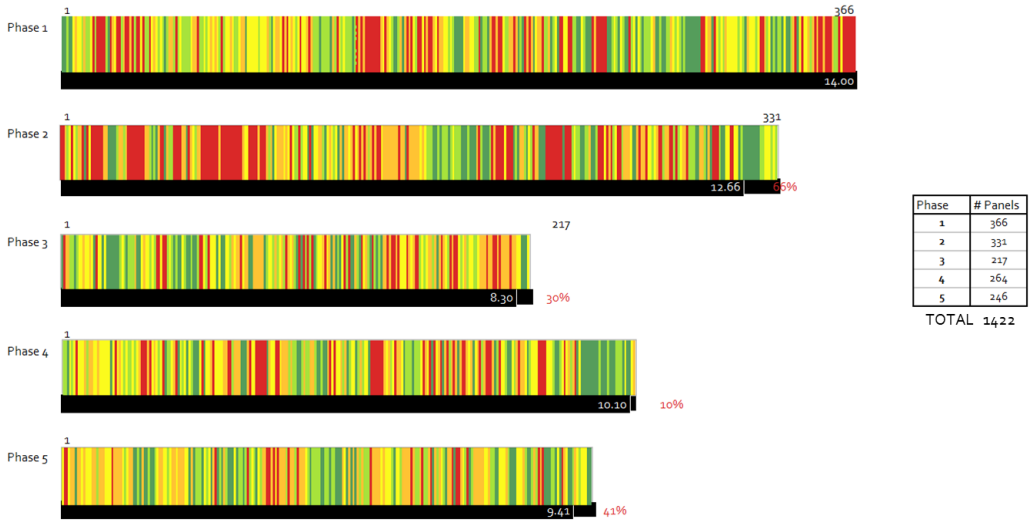


Figure 58. Heat maps of each phase indicating areas of concentrated panels in relatively good condition (green) and relatively poor condition (red).

Since the red and yellow colors tend to be more eye-catching than the greens, it is also helpful to look at subsets of the data that include only the highest or lowest grades. Figure 59 through Figure 63 are examples of subsets of the heat map data for each Phase. The uppermost image in each figure shows the green to red heat map for the phase with all colors and grades included. The second image shows only the panels in the bottom 20th percentile (Grade of "F"). The third image shows only the panels in the bottom 40th percentile (Grades of "D" or "F"). The fourth image shows only the panels in the bottom 60th percentile (Grades of "C", "D", or "F"). The fifth image shows only the panels in the top 40th percentile (Grades of "A" or "B"). The final image shows panels of all grades using a grayscale color palette, rather than green, yellow, orange, and red.

The heat maps can assist with prioritizing repairs since areas with relatively concentrated poor conditions are more readily visible. If the stakeholders elect to repair or replace areas of panels that are in the worst condition first, decisions on the first areas can be made more readily by observing the largest concentrated bands of red and orange panels.

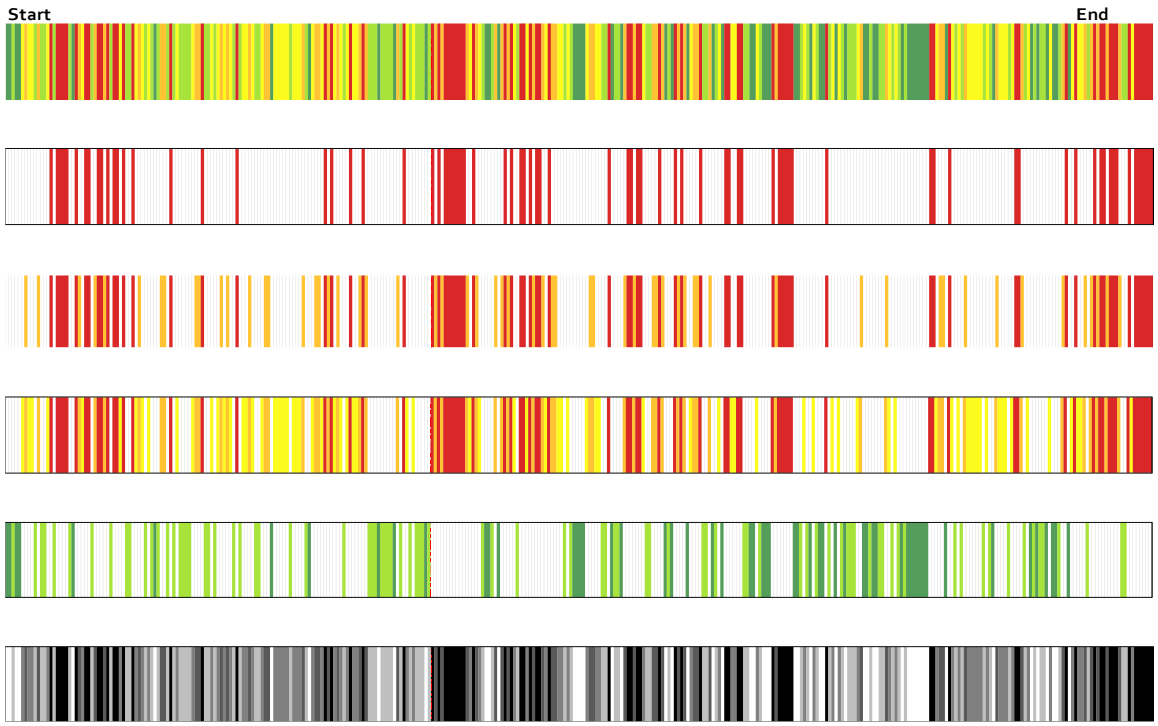


Figure 59. Phase 1 heat maps with all grades included in the top and bottom images and only selected grades in the others.

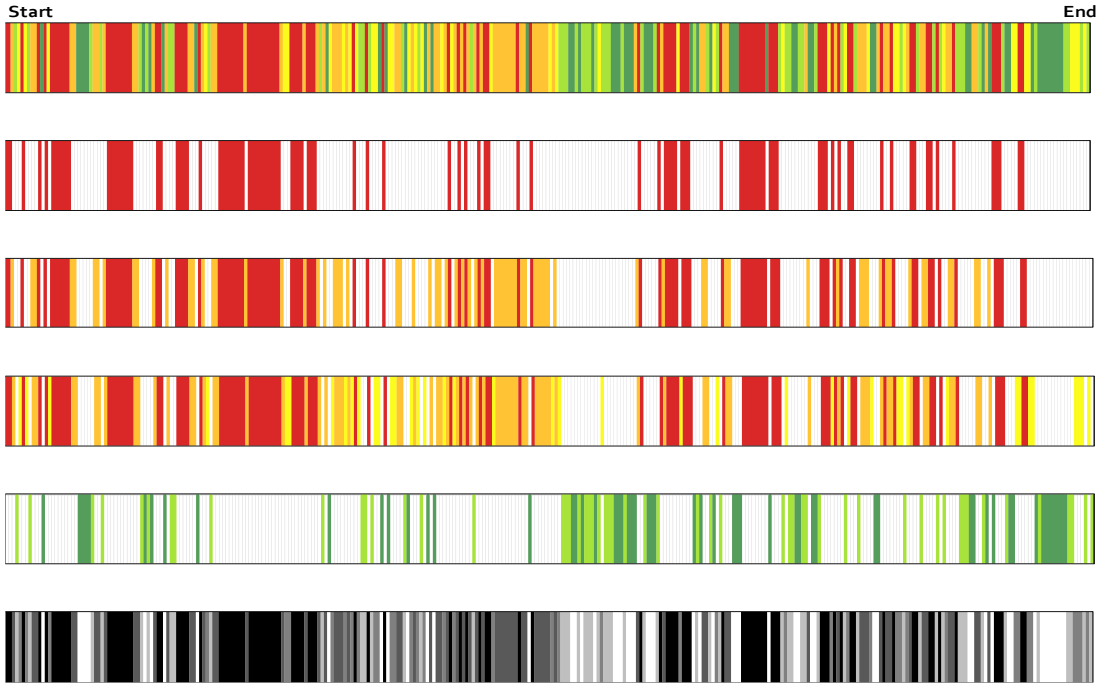


Figure 60. Phase 2 heat maps with all grades included in the top and bottom images and only selected grades in the others.

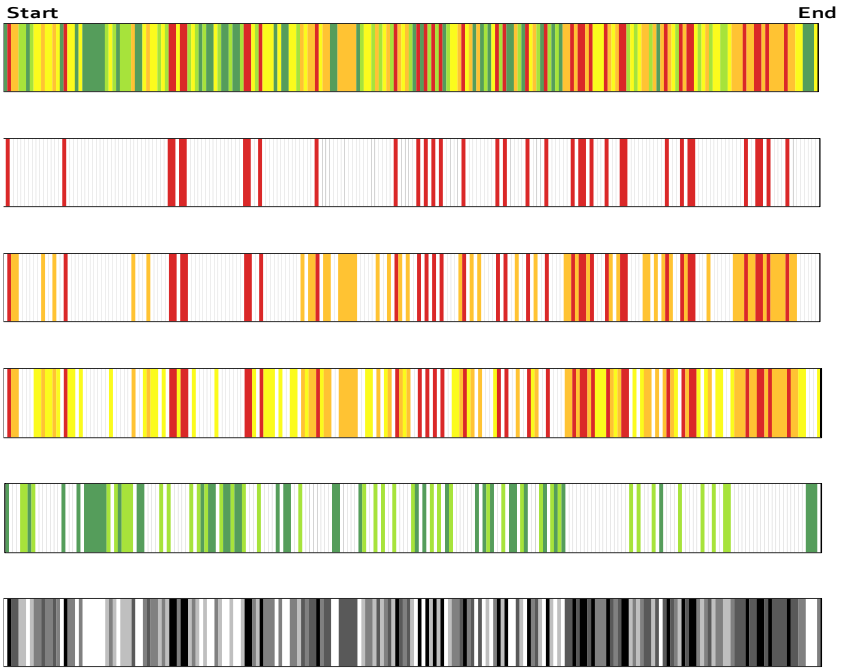


Figure 61. Phase 3 heat maps with all grades included in the top and bottom images and only selected grades in the others.

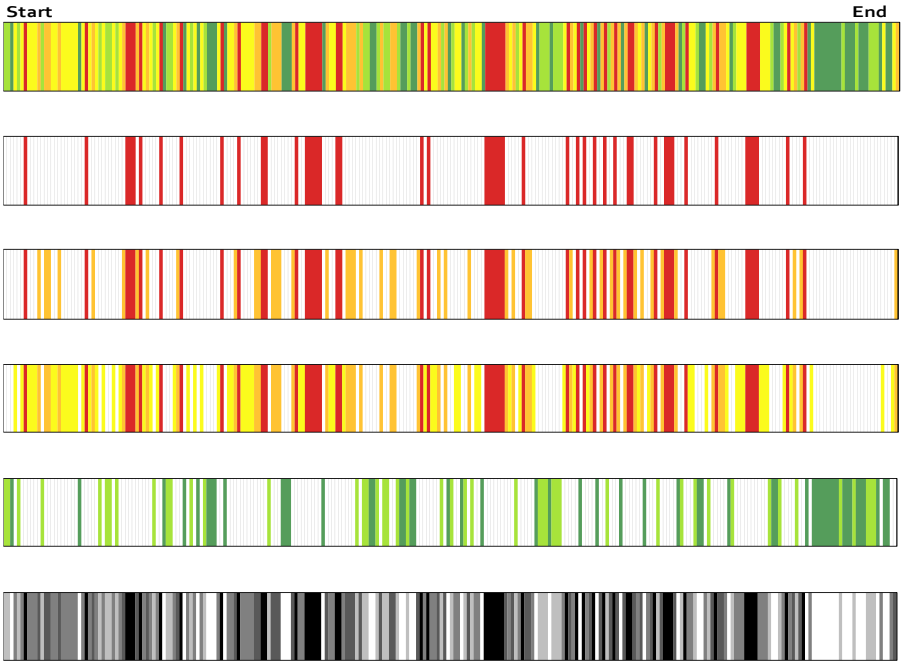


Figure 62. Phase 4 heat maps with all grades included in the top and bottom images and only selected grades in the others.

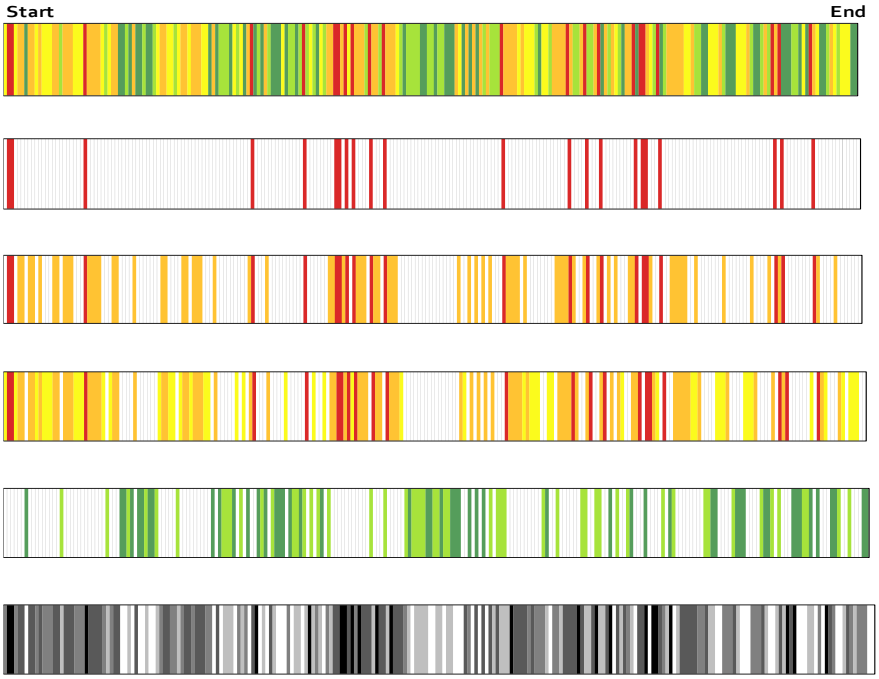


Figure 63. Phase 5 heat maps with all grades included in the top and bottom images and only selected grades in the others.

5.3 GIS Map

Another very helpful visualization tool for panel conditions is insertion of condition information into GIS software. While the linear heat maps described in the previous section help provide information regarding concentrated areas of distress, these diagrams do not provide specific information about where each panel is located. When grading information is input into GIS software, the GPS coordinates for each panel (from the camera) can be displayed with color-coded grade information. This quickly allows both decision-makers and residents to understand the conditions in specific areas. The use of actual panel locations is more beneficial for phasing of repairs since repair areas can be grouped by location more readily.

ANA provided GPS location and grade data for each panel as shown in Figure 64. A compilation of all of the panel grading information is also attached to this report as Appendix A. The maps showing panel locations by phase and number are attached as Appendix B. The City of Lone Tree is in the process of inputting this data into their GIS software at the time of this report. Examples of the types of displays available in the GIS software are shown in Figure 65 and Figure 66

Panel Number	GPS Latitude	GPS Longitude	Numerical Grade	Letter Grade	Color Name	RGB Color	Hex Color
P1-001	39.545448	-104.904259	88%	A	Dark Green	(85,157,91)	#559d5b
P1-002	39.5454486	-104.904221	90%	A	Dark Green	(85,157,91)	#559d5b
P1-003	39.545555	-104.904182	82%	B	Light Green	(167,227,50)	#a7e332
P1-004	39.545551	-104.904236	92%	A	Dark Green	(85,157,91)	#559d5b
P1-005	39.545612	-104.904121	85%	A	Dark Green	(85,157,91)	#559d5b
P1-006	39.545582	-104.90403	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-007	39.545597	-104.903954	65%	D	Orange	(255,195,51)	#ffc333
P1-008	39.545578	-104.903877	75%	C	Yellow	(251,251,29)	#fbfb1d
P1-009	39.545574	-104.903862	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-010	39.545567	-104.903824	80%	B	Light Green	(167,227,50)	#a7e332
P1-011	39.5455486	-104.903793	59%	D	Orange	(255,195,51)	#ffc333
P1-012	39.545624	-104.90374	75%	B	Light Green	(167,227,50)	#a7e332
P1-013	39.54562	-104.903656	79%	B	Light Green	(167,227,50)	#a7e332
P1-014	39.545616	-104.903595	69%	C	Yellow	(251,251,29)	#fbfb1d
P1-015	39.545612	-104.903542	55%	F	Red	(218,40,40)	#da2828

Figure 64. Example of location and grade data provided by ANA for use in the City of Lone Tree GIS software.

Figure 65. Screenshot from GIS software showing a sample of grade data displayed at the actual panel locations on a satellite view.

Figure 66. Screenshot from GIS software showing a sample of grade data displayed at the actual panel locations on a street map.

5.4 Comparison to Previous Observations

Since ANA completed a study of a sample of these same panels approximately 10 years ago, some comparisons can be made between the conditions observed at that time and the conditions observed in 2021 in order to get a feel for the rate of deterioration. The previous ANA report also provides statistics about percentages of panels exhibiting various conditions (from the 150-panel sample studied) that can be compared to the recent study.

For example, Table 5 includes a summary of the sagging panels observed in 2011 and in 2021. The total percentage of panels with observed sagging in 2011 was 43%, and it was 67% in 2021. It is important to note that the 2011 survey did not provide any indication of the severity of sag at each panel. However, in comparing photographs from 2011 and 2021 from the same panels, it is clear that sagging distress has become more severe over the past 10 years. An example is shown in Figure 67 and Figure 68.

Table 5. Portion of panels that exhibit sagging in each construction phase in 2011 and 2021 and % increase.

2011 Observations		2021 Observations		Change
Construction Phase	% of sagging panels	Construction Phase	% of sagging panels	% Increase
1	34	1	51	17
2	55	2	75	20
3	51	3	71	20
4	34	4	66	32
5	41	5	75	33
TOTAL	**43**	**TOTAL**	**67**	**24**

Figure 67. Sagging at P1-323 as photographed in 2011.

Figure 68. Sagging P1-323 as photographed in 2021.

Comparisons of distress conditions in 2011 and 2021 for various other types of distress are summarized in Table 6. The most dramatic increase in distress was related to cracking. The percentage of panels with cracks observed in 2011 was only 29%, while the percentage in 2021 was 91%.

Table 6. Percentages of panels that exhibited various types of distress in 2011 and 2021 and % increase.

Type of Distress	% of Panels in 2011	% of Panels in 2021	% Increase
Spalling (all types)	62%	96%	34%
Efflorescence	61%	79%	18%
Cracks	29%	96%	67%
Corrosion	5%	11%	6%

6.0 Conclusions and Recommendations

As described in the previous sections of this report, the distress conditions observed as part of this study are widespread and significant. Deterioration has become more severe since the 2011 study both in terms of percentages of panels affected and the severity of the distress at each panel. The 2021 observations also represent conditions at a point in time, and it is anticipated that panel deterioration will continue to get worse over time. Unfortunately, most structures do not experience gradual, linear rates of deterioration. Often, things that are exposed to the environment will have very little deterioration immediately after construction. However, once some flaw is opened (for example, a crack in a concrete road), this defect attracts more deterioration (such as freeze-thaw damage from water and ice collecting in a crack). This results in the rate of deterioration accelerating over time, as shown in Figure 69. This exponential rate of deterioration is common in most construction that is exposed to the elements.

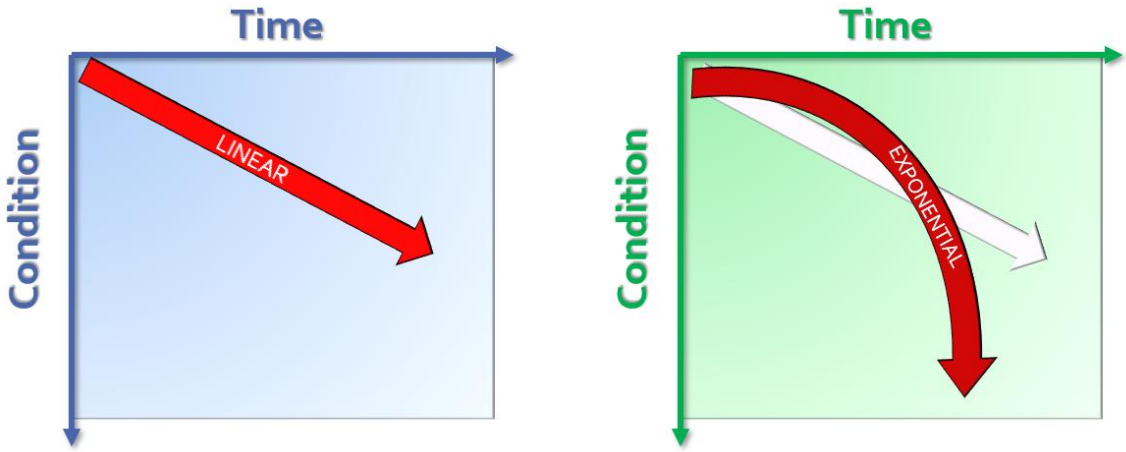


Figure 69. (Left) A theoretical linear deterioration curve where the same amount of distress happens each year. This type of deterioration is uncommon for structures. (Right) An exponential deterioration curve where the rate of deterioration is very low following construction but gradually increases over time.

Exponential rates of deterioration for this brick wall study can be illustrated with freeze-thaw damage to wall caps. When caps are new, most rainwater and snow melt will tend to sheet off of the surfaces of the

unblemished units. Very little water will absorb into the units themselves. Therefore, the brick will tend to stay in a "like new" condition for a while. However, once the fraction of the water that absorbs into the brick undergoes sufficient freeze-thaw cycles, the affected surfaces can begin to get microcracks and pitting that makes the surfaces both more absorbent and increases the surface area, as illustrated in Figure 70. Freeze-thaw damage is caused when water within a unit freezes and expands. This expansion causes pressure on the surface that tends to cause cracking and spalling. After some initial distress, the increased surface area and porosity allows for significantly more moisture to be absorbed into the unit, which accelerates the rate of deterioration. Soon, larger cracks and spalls will open up that tend to trap even more moisture and increase deterioration rates even further. This leads to the rate of deterioration increasing over time once some level of deterioration has initiated. Unfortunately, at the subject brick walls, 96% of panels with caps have already demonstrated at least some surface spalling.

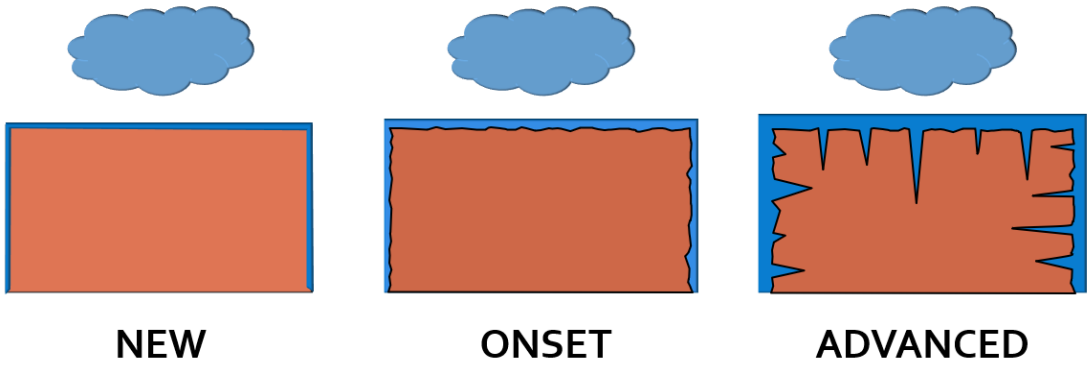


Figure 70. Schematic diagram of increasing roughness and surface area of brick caused by freeze-thaw deterioration that leads to increasing rates of distress.

6.1 Prioritization

Since areas of significant distress will tend to deteriorate more quickly than brick walls that are in relatively good condition, it is logical to focus repair and/or replacement campaigns in areas of significant damage first. However, jumping between individual panels that are spread apart is not an efficient use of materials and mobilization. Therefore, finding groups of panels in poor condition is one reasonable means of prioritizing repairs. The heat map and GIS tools can be used to find these groups of distress in order to prioritize repair efforts. An example of how this could be done is provided below. A portion of the Phase 2 heat map is shown in Figure 71 from Section C, Panels P2-047 through P2-081. The location of these panels is provided in Figure 72, and a summary of the grades is provided in Table 7. This area has a high concentration of panels in the bottom 20th percentile. Since the panels are grouped together, it would be relatively efficient to repair or replace multiple panels in the same area in a single mobilization.

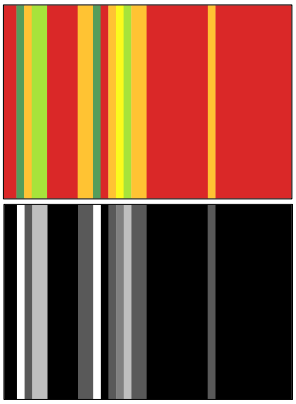


Figure 71. Portion of Phase 2 Heat Map in color (top) and black and white (bottom) in an area of concentrated poor conditions.

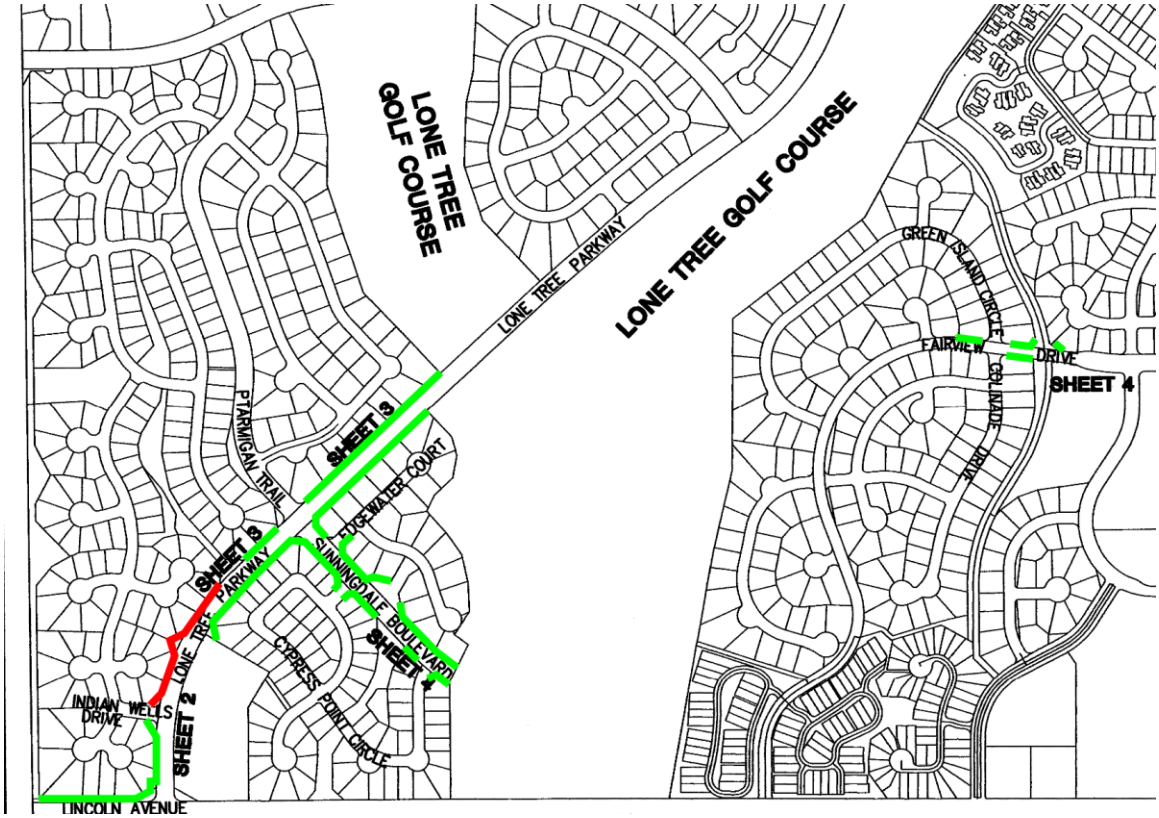


Figure 72. Location shown in red of the area represented by the Heat Map in Figure 71.

Table 7. Summary of the grades in the section of brick wall shown in Figure 71 and Figure 72.

Grade	Number of Occurrences
A	2
B	3
C	1
D	7
F	22
TOTAL	**35**

6.2 Types of Repairs

As with most structures, there are various options for repair or replacement available with various advantages and disadvantages. In general, for the subject brick walls, there are interventions or maintenance options that will improve conditions and appearances somewhat but do not address the fundamental causes of distress. There are also more complete repair or replacement options that address root causes of distress but often tend to have a more expensive up-front cost. There are pros and cons associated with interventions and replacements, and decisions regarding appropriate action will likely be informed by budgets and other factors beyond the scope of this report. A table summarizing intervention/maintenance task options for each type of distress and more permanent repair or replacement options is provided in Table 8.

Table 8. List of various types of distress and associated less expensive interventions or more invasive repair or replacement options.

Distress	Intervention / Maintenance	Repair/Replacement
Panel Sagging	Repoint mortar joints – fails in a few years	• Add foundation, localized rebuild (in-situ) • Surface reinforcing (in-situ) • Replace panel
Horizontal Cracking	Repoint joints – movement continues	• Repoint and cut in expansion joints (in-situ) • Replace panel
Column Pop-up	Repoint joints – movement continues	• Repoint, reinforce, and cut in expansion joints (in-situ) • Replace panel
Spalling (panel, cap, and column)	Spray with repellent – 3-year cycle Replace affected units – not efficient	• Replace entire cap (improve geometry and expansion joints) • Replace panel

Distress	Intervention / Maintenance	Repair/Replacement
Efflorescence	Clean panel areas – may reappear with excessive moisture	
Cleaning	Clean panel areas	
Retained Soil	Cooperative effort at soil removal	• Soil removal • Reconfigure soil during replacement

From a technical standpoint, many lesser interventions will tend to have relatively short life cycles. For example, there were locations where mortar had been pointed into cracks and openings at sagging panels. These interventions were often obvious due to the joint size and mortar color. At most of these interventions, cracking had already restarted at the sagging area within the repair. It is likely that the observed repairs are less than 5 years old, so it is reasonable to infer that similar interventions would have similarly short life cycles of a few years before damage resumed. In general, interventions or maintenance that does not address the fundamental causes of distress will tend to have limited long-term benefit. For example, much of the horizontal cracking observed appears to be related to improper expansion joint construction, especially at wall caps. Therefore, if cracks are pointed and filled but expansion joint conditions are not modified, it would be expected that cracking would recur after these interventions. If, however, expansion joints were also repaired (for example, by cutting new joints or replacing the caps) cracking should discontinue after repairs. Other examples of intervention or maintenance items that tend to have short-lived impact without addressing fundamental causes of distress are cleaning of efflorescence without reducing moisture conditions that cause the efflorescence and localized replacement of spalled units without addressing overall drainage issues and leaving sub-standard materials in place adjacent to the replaced units.

An example of a partial replacement option that would tend to address several underlying causes of distress, resulting in a relatively efficient repair option is the replacement of wall caps. Replacement of caps with properly detailed caps constructed of high-quality materials would address the following types of distress and their underlying causes:

- Cap spalling associated with sub-standard brick materials and poor drainage
- Cap solid expansion joint associated with filled or tight joints at column
- Horizontal cracking associated with poor cap expansion joint installation
- Column pop-up associated with poor cap expansion joint installation
- Column cap spalling associated with poor drainage
- Missing brick units associated with expansion joint conditions and poor-quality brick.

It is important to note that replacement of panel caps does not address the fundamental causes of all of the observed types of distress. For example, panel sagging would tend to continue unabated in panels with replaced caps, and the substandard brick used at the remaining panel and column areas would still be subject to spalling and deterioration. Since sagging distress is so widespread (67% of observed panels), replacement of panel caps alone is less appealing as an intervention. Many panels would tend to continue to display sagging distress if this were not also addressed.

Unfortunately, remedial options for panel sagging are limited. At similar brick walls in the Denver metropolitan area, ANA has designed and priced options for in-situ repair of panel sagging. These options included topical reinforcement analogous to structural plaster, adding a foundation at center span, and installing grade beams beneath the panels. Due to the expansive soils present in Lone Tree,

altering foundation conditions would be problematic. Based on mockups of the various repair methods, it was determined that the price associated with repairs would be similar to demolition and reconstruction of panels. The repair-in-place methods have the benefit of being less disruptive to homeowners. However, these methods do not address other distress concerns such as expansion joint conditions and retained soil. These repairs would also leave in place substandard brick materials that have already begun to deteriorate.

The demolition and reconstruction of complete panels (not including foundations) would tend to be among the more expensive remedial options. However, it has multiple benefits, including the following:

- Reconstructed panels could be built using better quality brick materials that will last longer than the original.
- New panels with proper materials and design would provide safer and more functional walls.
- Reconstructed panels could be designed using details that will tend to eliminate sagging.
- Reconstructed panels could be detailed with functional panel and cap expansion joints, virtually eliminating the tendency to develop horizontal cracks or column pop-up.
- New panels would not only reset the maintenance clock but also extend the maintenance cycle if better details and materials are used. Properly designed and constructed brick replacement walls should have a life cycle of well over 50 years.
- Reconstructed panels could be built with consistent appearance and aesthetics, whereas patches and repairs are often imperfectly matched with the surrounding materials.
- Demolition and reconstruction tasks are rather straightforward tasks that would be more likely to receive several competitive bids, while repair contractors are more specialized and rare.

Naturally, there are also challenges associated with demolition and reconstruction of panels. In addition to cost, removing brick walls may require temporary fencing, will require extensive access into multiple back yards, and may result in damage or reconfiguration of landscaping. The logistical challenges of removing and replacing panels will be more numerous and onerous than simpler repair-in-place options.

6.3 Cost Estimate

In order to aid with the decision-making process, ANA has provided the following engineering cost estimates for various types of repair and replacement options (Table 9). These values are approximate and do not represent a bid by ANA or any other entity to perform the work. Values are shown for both executing each type of remediation on the affected panels (or some other subset of panels) and on all of the panels observed (1422).

Cost estimates include demolition, general conditions, design, and landscape allowances, where applicable.

Table 9. List of various remediation options and associated costs for subsets of panels and all panels.

Remediation	Approximate Unit Cost Per Panel	Subset of Panels (Number of Panels)	Cost of Subset Only	Cost for 100% of Panels (1422)
Removal and Replacement of Panels	$6,500	All Panels with Collapse Panel Sagging (128)	$832,000	$9,243,000
Replacement of Cap Only	$1,500	Cap Spalling Exceeding 40% of Units (427)	$640,500	$2,133,000

Remediation	Approximate Unit Cost Per Panel	Subset of Panels (Number of Panels)	Cost of Subset Only	Cost for 100% of Panels (1422)
Repointing Cracks	$20 per sq. ft. $500 per panel	Panels with Cracks (1365)	$682,500	n/a
Localized Rebuilding of Spalled Brick in Panels (not Caps or Columns)	$35 per sq. ft. $350 per panel	Panels with Panel Spalling (327)	$114,450	n/a

6.4 Recommendations

Ultimately, the decisions regarding remedial action are subject to budget and other considerations that are beyond the scope of this report. However, ANA can offer the following recommendations based on technical considerations:

- Prioritize concentrated areas of panels in poor condition for earliest remediation since these panels will tend to deteriorate most quickly. Groups of at least ten contiguous panels will reduce mobilization costs.
- Replacement of entire panels offers the most permanent solution with the longest life cycle.
- Replacement of panel caps offers significant benefits but does not address panel sagging and several other types of distress.
- Maintenance interventions such as repointing cracks with mortar have some benefits, such as reducing localized water infiltration. However, these interventions will tend to have short life cycles unless the underlying causes are addressed.

We appreciate the opportunity to work with you on this matter. Please feel free to call if you have any questions.

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APPENDIX A

Locations and Grades for Each Panel

Organized by Phase and Panel Number with GPS Coordinates

Panel Number	GPS Latitude	GPS Longitude	Numerical Grade	Letter Grade	Color Name	RGB Color	Hex Color
P1-001	39.545448	-104.904259	88%	A	Dark Green	(85,157,91)	#559d5b
P1-002	39.545486	-104.904221	90%	A	Dark Green	(85,157,91)	#559d5b
P1-003	39.545555	-104.904182	82%	B	Light Green	(167,227,50)	#a7e332
P1-004	39.545551	-104.904236	92%	A	Dark Green	(85,157,91)	#559d5b
P1-005	39.545612	-104.904121	85%	A	Dark Green	(85,157,91)	#559d5b
P1-006	39.545582	-104.90403	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-007	39.545597	-104.903954	65%	D	Orange	(255,195,51)	#ffc333
P1-008	39.545578	-104.903877	75%	C	Yellow	(251,251,29)	#fbfb1d
P1-009	39.545574	-104.903862	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-010	39.545567	-104.903824	80%	B	Light Green	(167,227,50)	#a7e332
P1-011	39.545586	-104.903793	59%	D	Orange	(255,195,51)	#ffc333
P1-012	39.545624	-104.90374	75%	B	Light Green	(167,227,50)	#a7e332
P1-013	39.54562	-104.903656	79%	B	Light Green	(167,227,50)	#a7e332
P1-014	39.545616	-104.903595	69%	C	Yellow	(251,251,29)	#fbfb1d
P1-015	39.545612	-104.903542	55%	F	Red	(218,40,40)	#da2828
P1-016	39.545624	-104.903458	79%	B	Light Green	(167,227,50)	#a7e332
P1-017	39.545612	-104.903374	57%	F	Red	(218,40,40)	#da2828
P1-018	39.545605	-104.903297	53%	F	Red	(218,40,40)	#da2828
P1-019	39.54562	-104.903229	58%	F	Red	(218,40,40)	#da2828
P1-020	39.545612	-104.903137	39%	F	Red	(218,40,40)	#da2828
P1-021	39.545601	-104.903107	77%	B	Light Green	(167,227,50)	#a7e332
P1-022	39.545593	-104.903023	85%	A	Dark Green	(85,157,91)	#559d5b
P1-023	39.545601	-104.902954	57%	F	Red	(218,40,40)	#da2828
P1-024	39.545628	-104.902893	59%	D	Orange	(255,195,51)	#ffc333
P1-025	39.545609	-104.902809	73%	C	Yellow	(251,251,29)	#fbfb1d
P1-026	39.545639	-104.90274	58%	F	Red	(218,40,40)	#da2828
P1-027	39.545628	-104.902695	53%	F	Red	(218,40,40)	#da2828
P1-028	39.545624	-104.902626	83%	B	Light Green	(167,227,50)	#a7e332
P1-029	39.545616	-104.902534	64%	D	Orange	(255,195,51)	#ffc333
P1-030	39.545624	-104.902466	55%	F	Red	(218,40,40)	#da2828
P1-031	39.545631	-104.902382	53%	F	Red	(218,40,40)	#da2828
P1-032	39.545643	-104.902321	61%	D	Orange	(255,195,51)	#ffc333
P1-033	39.545635	-104.902237	59%	F	Red	(218,40,40)	#da2828
P1-034	39.54565	-104.902176	83%	B	Light Green	(167,227,50)	#a7e332
P1-035	39.545662	-104.902107	55%	F	Red	(218,40,40)	#da2828
P1-036	39.54567	-104.902031	59%	F	Red	(218,40,40)	#da2828
P1-037	39.545677	-104.901955	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-038	39.545692	-104.901878	58%	F	Red	(218,40,40)	#da2828
P1-039	39.545681	-104.901794	79%	B	Light Green	(167,227,50)	#a7e332
P1-040	39.545731	-104.901764	83%	B	Light Green	(167,227,50)	#a7e332
P1-041	39.545723	-104.901695	41%	F	Red	(218,40,40)	#da2828
P1-042	39.545753	-104.901634	72%	C	Yellow	(251,251,29)	#fbfb1d
P1-043	39.545765	-104.90155	61%	D	Orange	(255,195,51)	#ffc333
P1-044	39.545788	-104.901482	70%	C	Yellow	(251,251,29)	#fbfb1d
P1-045	39.545815	-104.901436	82%	B	Light Green	(167,227,50)	#a7e332
P1-046	39.545818	-104.901367	73%	C	Yellow	(251,251,29)	#fbfb1d
P1-047	39.545979	-104.900833	78%	B	Light Green	(167,227,50)	#a7e332
P1-048	39.54599	-104.900764	85%	A	Dark Green	(85,157,91)	#559d5b
P1-049	39.54604	-104.900688	76%	B	Light Green	(167,227,50)	#a7e332
P1-050	39.54607	-104.90062	60%	D	Orange	(255,195,51)	#ffc333
P1-051	39.546078	-104.900566	62%	D	Orange	(255,195,51)	#ffc333
P1-052	39.54612	-104.900505	80%	B	Light Green	(167,227,50)	#a7e332
P1-053	39.546135	-104.900444	28%	F	Red	(218,40,40)	#da2828
P1-054	39.546165	-104.900383	78%	B	Light Green	(167,227,50)	#a7e332
P1-055	39.546192	-104.900307	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-056	39.546207	-104.900238	82%	B	Light Green	(167,227,50)	#a7e332
P1-057	39.546215	-104.900162	84%	B	Light Green	(167,227,50)	#a7e332
P1-058	39.546207	-104.900116	78%	B	Light Green	(167,227,50)	#a7e332

P1-059	39.546524	-104.897118	78%	B	Light Green	(167,227,50)	#a7e332
P1-060	39.546528	-104.897011	69%	C	Yellow	(251,251,29)	#fbfb1d
P1-061	39.546524	-104.896927	64%	D	Orange	(255,195,51)	#ffc333
P1-062	39.546528	-104.896881	66%	D	Orange	(255,195,51)	#ffc333
P1-063	39.546509	-104.896805	57%	F	Red	(218,40,40)	#da2828
P1-064	39.546501	-104.896736	78%	B	Light Green	(167,227,50)	#a7e332
P1-065	39.546509	-104.89666	76%	B	Light Green	(167,227,50)	#a7e332
P1-066	39.54652	-104.896614	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-067	39.54649	-104.896545	76%	B	Light Green	(167,227,50)	#a7e332
P1-068	39.546478	-104.896454	70%	C	Yellow	(251,251,29)	#fbfb1d
P1-069	39.546486	-104.896385	64%	D	Orange	(255,195,51)	#ffc333
P1-070	39.546249	-104.896019	68%	C	Yellow	(251,251,29)	#fbfb1d
P1-071	39.546333	-104.895973	61%	D	Orange	(255,195,51)	#ffc333
P1-072	39.546333	-104.895912	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-073	39.546368	-104.895866	83%	B	Light Green	(167,227,50)	#a7e332
P1-074	39.546375	-104.89576	48%	F	Red	(218,40,40)	#da2828
P1-075	39.546352	-104.895691	79%	B	Light Green	(167,227,50)	#a7e332
P1-076	39.546345	-104.895622	72%	C	Yellow	(251,251,29)	#fbfb1d
P1-077	39.546341	-104.895592	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-078	39.546295	-104.8955	60%	D	Orange	(255,195,51)	#ffc333
P1-079	39.546299	-104.895462	72%	C	Yellow	(251,251,29)	#fbfb1d
P1-080	39.546288	-104.895401	78%	B	Light Green	(167,227,50)	#a7e332
P1-081	39.546227	-104.895309	81%	B	Light Green	(167,227,50)	#a7e332
P1-082	39.546249	-104.895195	70%	C	Yellow	(251,251,29)	#fbfb1d
P1-083	39.546219	-104.895195	65%	D	Orange	(255,195,51)	#ffc333
P1-084	39.54623	-104.895126	65%	D	Orange	(255,195,51)	#ffc333
P1-085	39.546143	-104.895065	95%	A	Dark Green	(85,157,91)	#559d5b
P1-086	39.546154	-104.895012	67%	C	Yellow	(251,251,29)	#fbfb1d
P1-087	39.546131	-104.894958	72%	C	Yellow	(251,251,29)	#fbfb1d
P1-088	39.546082	-104.89489	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-089	39.546066	-104.894836	67%	C	Yellow	(251,251,29)	#fbfb1d
P1-090	39.546005	-104.894768	69%	C	Yellow	(251,251,29)	#fbfb1d
P1-091	39.546005	-104.894707	77%	B	Light Green	(167,227,50)	#a7e332
P1-092	39.54599	-104.894653	69%	C	Yellow	(251,251,29)	#fbfb1d
P1-093	39.545982	-104.894585	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-094	39.545895	-104.894531	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-095	39.545864	-104.894478	65%	D	Orange	(255,195,51)	#ffc333
P1-096	39.545868	-104.894424	76%	B	Light Green	(167,227,50)	#a7e332
P1-097	39.545818	-104.894371	90%	A	Dark Green	(85,157,91)	#559d5b
P1-098	39.545792	-104.894333	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-099	39.545753	-104.894272	61%	D	Orange	(255,195,51)	#ffc333
P1-100	39.545712	-104.894203	65%	D	Orange	(255,195,51)	#ffc333
P1-101	39.545692	-104.894165	67%	C	Yellow	(251,251,29)	#fbfb1d
P1-102	39.545647	-104.894104	58%	F	Red	(218,40,40)	#da2828
P1-103	39.545597	-104.894043	65%	D	Orange	(255,195,51)	#ffc333
P1-104	39.545567	-104.893997	52%	F	Red	(218,40,40)	#da2828
P1-105	39.545532	-104.893959	72%	C	Yellow	(251,251,29)	#fbfb1d
P1-106	39.545483	-104.893883	63%	D	Orange	(255,195,51)	#ffc333
P1-107	39.545506	-104.893829	73%	C	Yellow	(251,251,29)	#fbfb1d
P1-108	39.54541	-104.893799	77%	B	Light Green	(167,227,50)	#a7e332
P1-109	39.545353	-104.8937	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-110	39.545338	-104.893654	41%	F	Red	(218,40,40)	#da2828
P1-111	39.545288	-104.893639	72%	C	Yellow	(251,251,29)	#fbfb1d
P1-112	39.545288	-104.893608	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-113	39.545223	-104.893616	64%	D	Orange	(255,195,51)	#ffc333
P1-114	39.545155	-104.893562	34%	F	Red	(218,40,40)	#da2828
P1-115	39.54512	-104.893608	65%	D	Orange	(255,195,51)	#ffc333
P1-116	39.545109	-104.893539	80%	B	Light Green	(167,227,50)	#a7e332
P1-117	39.544998	-104.89357	84%	B	Light Green	(167,227,50)	#a7e332

P1-118	39.545067	-104.893517	84%	B	Light Green	(167,227,50)	#a7e332
P1-119	39.544979	-104.893547	87%	A	Dark Green	(85,157,91)	#559d5b
P1-120	39.544933	-104.893456	83%	B	Light Green	(167,227,50)	#a7e332
P1-121	39.54491	-104.893417	83%	B	Light Green	(167,227,50)	#a7e332
P1-122	39.544903	-104.893379	75%	B	Light Green	(167,227,50)	#a7e332
P1-123	39.544792	-104.893303	81%	B	Light Green	(167,227,50)	#a7e332
P1-124	39.544739	-104.893303	86%	A	Dark Green	(85,157,91)	#559d5b
P1-125	39.544697	-104.893372	64%	D	Orange	(255,195,51)	#ffc333
P1-126	39.544674	-104.893433	79%	B	Light Green	(167,227,50)	#a7e332
P1-127	39.54464	-104.893509	58%	F	Red	(218,40,40)	#da2828
P1-128	39.544621	-104.893539	72%	C	Yellow	(251,251,29)	#fbfb1d
P1-129	39.544559	-104.893669	80%	B	Light Green	(167,227,50)	#a7e332
P1-130	39.544563	-104.893669	70%	C	Yellow	(251,251,29)	#fbfb1d
P1-131	39.544506	-104.893738	82%	B	Light Green	(167,227,50)	#a7e332
P1-132	39.544468	-104.893799	81%	B	Light Green	(167,227,50)	#a7e332
P1-133	39.544468	-104.893799	77%	B	Light Green	(167,227,50)	#a7e332
P1-134	39.544445	-104.893776	89%	A	Dark Green	(85,157,91)	#559d5b
P1-135	39.544395	-104.893791	78%	B	Light Green	(167,227,50)	#a7e332
P1-138	39.544399	-104.893875	39%	F	Red	(218,40,40)	#da2828
P1-139	39.544308	-104.893845	61%	D	Orange	(255,195,51)	#ffc333
P1-140	39.544304	-104.893898	42%	F	Red	(218,40,40)	#da2828
P1-141	39.544277	-104.893944	62%	D	Orange	(255,195,51)	#ffc333
P1-142	39.544262	-104.89399	57%	F	Red	(218,40,40)	#da2828
P1-143	39.544224	-104.894051	56%	F	Red	(218,40,40)	#da2828
P1-144	39.544212	-104.894104	53%	F	Red	(218,40,40)	#da2828
P1-145	39.544167	-104.894142	54%	F	Red	(218,40,40)	#da2828
P1-146	39.544128	-104.894211	52%	F	Red	(218,40,40)	#da2828
P1-147	39.544106	-104.894272	47%	F	Red	(218,40,40)	#da2828
P1-148	39.544079	-104.894325	54%	F	Red	(218,40,40)	#da2828
P1-149	39.544033	-104.894379	62%	D	Orange	(255,195,51)	#ffc333
P1-150	39.544003	-104.894432	67%	C	Yellow	(251,251,29)	#fbfb1d
P1-151	39.543983	-104.894493	59%	F	Red	(218,40,40)	#da2828
P1-152	39.543941	-104.894539	61%	D	Orange	(255,195,51)	#ffc333
P1-153	39.543922	-104.894577	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-154	39.54388	-104.894623	76%	B	Light Green	(167,227,50)	#a7e332
P1-155	39.543854	-104.894745	90%	A	Dark Green	(85,157,91)	#559d5b
P1-156	39.543861	-104.894791	96%	A	Dark Green	(85,157,91)	#559d5b
P1-157	39.543877	-104.894867	76%	B	Light Green	(167,227,50)	#a7e332
P1-158	39.5438	-104.89502	66%	D	Orange	(255,195,51)	#ffc333
P1-159	39.543728	-104.895012	85%	A	Dark Green	(85,157,91)	#559d5b
P1-160	39.54369	-104.895035	61%	D	Orange	(255,195,51)	#ffc333
P1-161	39.543629	-104.895081	57%	F	Red	(218,40,40)	#da2828
P1-162	39.543594	-104.895142	63%	D	Orange	(255,195,51)	#ffc333
P1-163	39.543556	-104.895195	47%	F	Red	(218,40,40)	#da2828
P1-164	39.543503	-104.895218	68%	C	Yellow	(251,251,29)	#fbfb1d
P1-165	39.54348	-104.895287	77%	B	Light Green	(167,227,50)	#a7e332
P1-166	39.543446	-104.895355	49%	F	Red	(218,40,40)	#da2828
P1-167	39.543423	-104.895393	57%	F	Red	(218,40,40)	#da2828
P1-168	39.543362	-104.895454	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-169	39.543327	-104.895523	47%	F	Red	(218,40,40)	#da2828
P1-170	39.543289	-104.895569	66%	D	Orange	(255,195,51)	#ffc333
P1-171	39.543282	-104.895607	53%	F	Red	(218,40,40)	#da2828
P1-172	39.543236	-104.895683	43%	F	Red	(218,40,40)	#da2828
P1-173	39.543213	-104.895729	64%	D	Orange	(255,195,51)	#ffc333
P1-174	39.543159	-104.895798	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-175	39.543129	-104.895836	56%	F	Red	(218,40,40)	#da2828
P1-176	39.543091	-104.895905	60%	D	Orange	(255,195,51)	#ffc333
P1-177	39.543056	-104.895966	64%	D	Orange	(255,195,51)	#ffc333
P1-178	39.54303	-104.896011	74%	C	Yellow	(251,251,29)	#fbfb1d

P1-179	39.542988	-104.896065	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-180	39.542965	-104.896118	78%	B	Light Green	(167,227,50)	#a7e332
P1-181	39.542923	-104.896133	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-182	39.545952	-104.904243	83%	B	Light Green	(167,227,50)	#a7e332
P1-183	39.545921	-104.904213	90%	A	Dark Green	(85,157,91)	#559d5b
P1-184	39.545872	-104.904182	92%	A	Dark Green	(85,157,91)	#559d5b
P1-185	39.545868	-104.904137	94%	A	Dark Green	(85,157,91)	#559d5b
P1-186	39.545868	-104.904243	85%	A	Dark Green	(85,157,91)	#559d5b
P1-187	39.545788	-104.904083	69%	C	Yellow	(251,251,29)	#fbfb1d
P1-188	39.545795	-104.903999	66%	D	Orange	(255,195,51)	#ffc333
P1-189	39.545815	-104.903946	62%	D	Orange	(255,195,51)	#ffc333
P1-190	39.545834	-104.9039	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-191	39.545826	-104.903877	68%	C	Yellow	(251,251,29)	#fbfb1d
P1-192	39.545818	-104.903816	78%	B	Light Green	(167,227,50)	#a7e332
P1-193	39.545799	-104.903763	84%	B	Light Green	(167,227,50)	#a7e332
P1-194	39.545795	-104.903725	56%	F	Red	(218,40,40)	#da2828
P1-195	39.545792	-104.903618	86%	A	Dark Green	(85,157,91)	#559d5b
P1-196	39.545792	-104.903549	76%	B	Light Green	(167,227,50)	#a7e332
P1-197	39.545845	-104.903488	81%	B	Light Green	(167,227,50)	#a7e332
P1-198	39.545815	-104.903542	90%	A	Dark Green	(85,157,91)	#559d5b
P1-199	39.545784	-104.903229	66%	D	Orange	(255,195,51)	#ffc333
P1-200	39.545776	-104.903168	49%	F	Red	(218,40,40)	#da2828
P1-201	39.545792	-104.903107	54%	F	Red	(218,40,40)	#da2828
P1-202	39.545776	-104.903069	61%	D	Orange	(255,195,51)	#ffc333
P1-203	39.545761	-104.902962	49%	F	Red	(218,40,40)	#da2828
P1-204	39.545757	-104.902908	52%	F	Red	(218,40,40)	#da2828
P1-205	39.546528	-104.899338	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-206	39.546535	-104.899292	82%	B	Light Green	(167,227,50)	#a7e332
P1-207	39.546528	-104.899239	79%	B	Light Green	(167,227,50)	#a7e332
P1-208	39.546532	-104.89917	65%	D	Orange	(255,195,51)	#ffc333
P1-209	39.546593	-104.898476	62%	D	Orange	(255,195,51)	#ffc333
P1-210	39.546604	-104.898415	53%	F	Red	(218,40,40)	#da2828
P1-211	39.546619	-104.898346	63%	D	Orange	(255,195,51)	#ffc333
P1-212	39.546612	-104.898285	86%	A	Dark Green	(85,157,91)	#559d5b
P1-213	39.546623	-104.898216	75%	B	Light Green	(167,227,50)	#a7e332
P1-214	39.546635	-104.89814	86%	A	Dark Green	(85,157,91)	#559d5b
P1-215	39.546619	-104.898079	59%	F	Red	(218,40,40)	#da2828
P1-216	39.546642	-104.89801	63%	D	Orange	(255,195,51)	#ffc333
P1-217	39.54665	-104.897934	58%	F	Red	(218,40,40)	#da2828
P1-218	39.546658	-104.897873	61%	D	Orange	(255,195,51)	#ffc333
P1-219	39.546658	-104.897789	86%	A	Dark Green	(85,157,91)	#559d5b
P1-220	39.546669	-104.897736	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-221	39.546669	-104.897659	61%	D	Orange	(255,195,51)	#ffc333
P1-222	39.546658	-104.897583	59%	D	Orange	(255,195,51)	#ffc333
P1-223	39.546665	-104.897514	57%	F	Red	(218,40,40)	#da2828
P1-224	39.546684	-104.897446	78%	B	Light Green	(167,227,50)	#a7e332
P1-225	39.546677	-104.897385	75%	B	Light Green	(167,227,50)	#a7e332
P1-226	39.546696	-104.897308	66%	D	Orange	(255,195,51)	#ffc333
P1-227	39.546669	-104.897232	93%	A	Dark Green	(85,157,91)	#559d5b
P1-228	39.546654	-104.8964	78%	B	Light Green	(167,227,50)	#a7e332
P1-229	39.546658	-104.8964	68%	C	Yellow	(251,251,29)	#fbfb1d
P1-230	39.546673	-104.896332	85%	A	Dark Green	(85,157,91)	#559d5b
P1-231	39.546516	-104.895714	56%	F	Red	(218,40,40)	#da2828
P1-232	39.54649	-104.895645	55%	F	Red	(218,40,40)	#da2828
P1-233	39.546474	-104.895576	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-234	39.546478	-104.895493	75%	C	Yellow	(251,251,29)	#fbfb1d
P1-235	39.546463	-104.895439	57%	F	Red	(218,40,40)	#da2828
P1-236	39.546425	-104.89537	58%	F	Red	(218,40,40)	#da2828
P1-237	39.54631	-104.894966	82%	B	Light Green	(167,227,50)	#a7e332

P1-238	39.546284	-104.894913	81%	B	Light Green	(167,227,50)	#a7e332
P1-239	39.546234	-104.894875	92%	A	Dark Green	(85,157,91)	#559d5b
P1-240	39.546215	-104.894798	88%	A	Dark Green	(85,157,91)	#559d5b
P1-241	39.546204	-104.89473	69%	C	Yellow	(251,251,29)	#fbfb1d
P1-242	39.546181	-104.894653	84%	B	Light Green	(167,227,50)	#a7e332
P1-243	39.546131	-104.894592	87%	A	Dark Green	(85,157,91)	#559d5b
P1-244	39.546104	-104.894539	87%	A	Dark Green	(85,157,91)	#559d5b
P1-245	39.546066	-104.89447	87%	A	Dark Green	(85,157,91)	#559d5b
P1-246	39.546047	-104.894424	57%	F	Red	(218,40,40)	#da2828
P1-247	39.546017	-104.894371	60%	D	Orange	(255,195,51)	#ffc333
P1-248	39.54599	-104.89431	46%	F	Red	(218,40,40)	#da2828
P1-249	39.545952	-104.894257	50%	F	Red	(218,40,40)	#da2828
P1-250	39.545902	-104.894196	55%	F	Red	(218,40,40)	#da2828
P1-251	39.545898	-104.894127	57%	F	Red	(218,40,40)	#da2828
P1-252	39.54586	-104.894066	49%	F	Red	(218,40,40)	#da2828
P1-253	39.545849	-104.894012	89%	A	Dark Green	(85,157,91)	#559d5b
P1-254	39.545902	-104.893967	90%	A	Dark Green	(85,157,91)	#559d5b
P1-255	39.545929	-104.893913	81%	B	Light Green	(167,227,50)	#a7e332
P1-256	39.54599	-104.893898	72%	C	Yellow	(251,251,29)	#fbfb1d
P1-257	39.546021	-104.893822	75%	B	Light Green	(167,227,50)	#a7e332
P1-258	39.546024	-104.893799	88%	A	Dark Green	(85,157,91)	#559d5b
P1-259	39.546085	-104.893753	75%	C	Yellow	(251,251,29)	#fbfb1d
P1-260	39.546116	-104.893692	77%	B	Light Green	(167,227,50)	#a7e332
P1-261	39.546165	-104.893639	88%	A	Dark Green	(85,157,91)	#559d5b
P1-262	39.5462	-104.893616	87%	A	Dark Green	(85,157,91)	#559d5b
P1-263	39.546249	-104.89357	55%	F	Red	(218,40,40)	#da2828
P1-264	39.54631	-104.893539	79%	B	Light Green	(167,227,50)	#a7e332
P1-265	39.54636	-104.893509	74%	C	Yellow	(251,251,29)	#fbfb1d
P1-266	39.546425	-104.893539	88%	A	Dark Green	(85,157,91)	#559d5b
P1-267	39.546459	-104.893547	72%	C	Yellow	(251,251,29)	#fbfb1d
P1-268	39.546501	-104.893539	80%	B	Light Green	(167,227,50)	#a7e332
P1-269	39.546566	-104.893539	86%	A	Dark Green	(85,157,91)	#559d5b
P1-270	39.546623	-104.893562	81%	B	Light Green	(167,227,50)	#a7e332
P1-271	39.546677	-104.893578	81%	B	Light Green	(167,227,50)	#a7e332
P1-272	39.546722	-104.893555	83%	B	Light Green	(167,227,50)	#a7e332
P1-273	39.546776	-104.893555	68%	C	Yellow	(251,251,29)	#fbfb1d
P1-274	39.546803	-104.893532	64%	D	Orange	(255,195,51)	#ffc333
P1-275	39.546883	-104.893593	89%	A	Dark Green	(85,157,91)	#559d5b
P1-276	39.546921	-104.893593	86%	A	Dark Green	(85,157,91)	#559d5b
P1-277	39.546978	-104.8936	83%	B	Light Green	(167,227,50)	#a7e332
P1-278	39.547012	-104.893631	89%	A	Dark Green	(85,157,91)	#559d5b
P1-279	39.547096	-104.893646	85%	A	Dark Green	(85,157,91)	#559d5b
P1-280	39.548008	-104.893967	83%	B	Light Green	(167,227,50)	#a7e332
P1-281	39.548008	-104.893867	79%	B	Light Green	(167,227,50)	#a7e332
P1-282	39.548031	-104.893829	60%	D	Orange	(255,195,51)	#ffc333
P1-283	39.548065	-104.893784	69%	C	Yellow	(251,251,29)	#fbfb1d
P1-284	39.548103	-104.893738	77%	B	Light Green	(167,227,50)	#a7e332
P1-285	39.548134	-104.893639	70%	C	Yellow	(251,251,29)	#fbfb1d
P1-286	39.548126	-104.893623	81%	B	Light Green	(167,227,50)	#a7e332
P1-287	39.548206	-104.893585	88%	A	Dark Green	(85,157,91)	#559d5b
P1-288	39.548244	-104.893532	75%	B	Light Green	(167,227,50)	#a7e332
P1-289	39.548244	-104.893478	86%	A	Dark Green	(85,157,91)	#559d5b
P1-290	39.548294	-104.893364	89%	A	Dark Green	(85,157,91)	#559d5b
P1-291	39.548244	-104.893333	89%	A	Dark Green	(85,157,91)	#559d5b
P1-292	39.548294	-104.893158	97%	A	Dark Green	(85,157,91)	#559d5b
P1-293	39.548325	-104.893143	88%	A	Dark Green	(85,157,91)	#559d5b
P1-294	39.548325	-104.893127	89%	A	Dark Green	(85,157,91)	#559d5b
P1-295	39.548386	-104.89315	96%	A	Dark Green	(85,157,91)	#559d5b
P1-296	39.548431	-104.893082	46%	F	Red	(218,40,40)	#da2828

P1-297	39.548454	-104.893036	51%	F	Red	(218,40,40)	#da2828
P1-298	39.54858	-104.892975	67%	C	Yellow	(251,251,29)	#fbfb1d
P1-299	39.548519	-104.892845	66%	D	Orange	(255,195,51)	#ffc333
P1-300	39.548534	-104.892799	61%	D	Orange	(255,195,51)	#ffc333
P1-301	39.548538	-104.8927	86%	A	Dark Green	(85,157,91)	#559d5b
P1-302	39.54847	-104.892616	59%	F	Red	(218,40,40)	#da2828
P1-303	39.54845	-104.892593	70%	C	Yellow	(251,251,29)	#fbfb1d
P1-304	39.548462	-104.892525	79%	B	Light Green	(167,227,50)	#a7e332
P1-305	39.548412	-104.892448	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-306	39.548397	-104.892372	81%	B	Light Green	(167,227,50)	#a7e332
P1-307	39.548405	-104.892288	67%	D	Orange	(255,195,51)	#ffc333
P1-308	39.548378	-104.892265	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-309	39.548454	-104.892189	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-310	39.54842	-104.892128	75%	C	Yellow	(251,251,29)	#fbfb1d
P1-311	39.548382	-104.892067	73%	C	Yellow	(251,251,29)	#fbfb1d
P1-312	39.548428	-104.891991	67%	C	Yellow	(251,251,29)	#fbfb1d
P1-313	39.548405	-104.891899	79%	B	Light Green	(167,227,50)	#a7e332
P1-314	39.548409	-104.891876	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-315	39.548401	-104.891785	81%	B	Light Green	(167,227,50)	#a7e332
P1-316	39.548389	-104.891754	90%	A	Dark Green	(85,157,91)	#559d5b
P1-317	39.54837	-104.891731	66%	D	Orange	(255,195,51)	#ffc333
P1-318	39.548332	-104.891556	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-319	39.548317	-104.891556	68%	C	Yellow	(251,251,29)	#fbfb1d
P1-320	39.548218	-104.891441	71%	C	Yellow	(251,251,29)	#fbfb1d
P1-321	39.548229	-104.891357	77%	B	Light Green	(167,227,50)	#a7e332
P1-322	39.548191	-104.891411	69%	C	Yellow	(251,251,29)	#fbfb1d
P1-323	39.548126	-104.891289	41%	F	Red	(218,40,40)	#da2828
P1-324	39.548054	-104.89119	53%	F	Red	(218,40,40)	#da2828
P1-325	39.548038	-104.891151	65%	D	Orange	(255,195,51)	#ffc333
P1-326	39.548019	-104.891121	76%	B	Light Green	(167,227,50)	#a7e332
P1-327	39.547993	-104.891121	73%	C	Yellow	(251,251,29)	#fbfb1d
P1-328	39.547939	-104.89106	85%	A	Dark Green	(85,157,91)	#559d5b
P1-329	39.547928	-104.891037	79%	B	Light Green	(167,227,50)	#a7e332
P1-330	39.547886	-104.890938	85%	A	Dark Green	(85,157,91)	#559d5b
P1-331	39.547817	-104.890945	78%	B	Light Green	(167,227,50)	#a7e332
P1-332	39.547817	-104.890884	78%	B	Light Green	(167,227,50)	#a7e332
P1-333	39.547737	-104.890869	88%	A	Dark Green	(85,157,91)	#559d5b
P1-334	39.547741	-104.890862	75%	C	Yellow	(251,251,29)	#fbfb1d
P1-335	39.547657	-104.890862	91%	A	Dark Green	(85,157,91)	#559d5b
P1-336	39.547611	-104.890846	91%	A	Dark Green	(85,157,91)	#559d5b
P1-337	39.547565	-104.890877	80%	B	Light Green	(167,227,50)	#a7e332
P1-338	39.547523	-104.890862	61%	D	Orange	(255,195,51)	#ffc333
P1-339	39.547478	-104.890877	38%	F	Red	(218,40,40)	#da2828
P1-340	39.547459	-104.89093	87%	A	Dark Green	(85,157,91)	#559d5b
P1-341	39.547413	-104.89093	70%	C	Yellow	(251,251,29)	#fbfb1d
P1-342	39.547379	-104.890976	45%	F	Red	(218,40,40)	#da2828
P1-343	39.547329	-104.890976	73%	C	Yellow	(251,251,29)	#fbfb1d
P1-344	39.547272	-104.891037	69%	C	Yellow	(251,251,29)	#fbfb1d
P1-345	39.547226	-104.891052	64%	D	Orange	(255,195,51)	#ffc333
P1-346	39.547195	-104.891106	81%	B	Light Green	(167,227,50)	#a7e332
P1-347	39.547157	-104.891121	61%	D	Orange	(255,195,51)	#ffc333
P1-348	39.547123	-104.891205	58%	F	Red	(218,40,40)	#da2828
P1-349	39.547058	-104.891212	66%	D	Orange	(255,195,51)	#ffc333
P1-350	39.546993	-104.891235	33%	F	Red	(218,40,40)	#da2828
P1-351	39.546955	-104.891289	56%	F	Red	(218,40,40)	#da2828
P1-352	39.546894	-104.891281	66%	D	Orange	(255,195,51)	#ffc333
P1-353	39.546841	-104.891296	33%	F	Red	(218,40,40)	#da2828
P1-354	39.54678	-104.891342	42%	F	Red	(218,40,40)	#da2828
P1-355	39.546776	-104.891449	47%	F	Red	(218,40,40)	#da2828

P1-356	39.546761	-104.891548	60%	D	Orange	(255,195,51)	#ffc333
P1-357	39.546776	-104.891609	83%	B	Light Green	(167,227,50)	#a7e332
P1-358	39.54678	-104.891655	82%	B	Light Green	(167,227,50)	#a7e332
P1-359	39.54681	-104.891731	49%	F	Red	(218,40,40)	#da2828
P1-360	39.547775	-104.890427	68%	C	Yellow	(251,251,29)	#fbfb1d
P1-361	39.547813	-104.890388	35%	F	Red	(218,40,40)	#da2828
P1-362	39.547829	-104.890327	45%	F	Red	(218,40,40)	#da2828
P1-363	39.547859	-104.890282	58%	F	Red	(218,40,40)	#da2828
P1-364	39.547894	-104.890221	38%	F	Red	(218,40,40)	#da2828
P1-365	39.547901	-104.890137	37%	F	Red	(218,40,40)	#da2828
P1-366	39.547981	-104.890091	54%	F	Red	(218,40,40)	#da2828
P2-001	39.536732	-104.904152	53%	F	Red	(218,40,40)	#da2828
P2-002	39.53672	-104.904068	41%	F	Red	(218,40,40)	#da2828
P2-003	39.536701	-104.903999	62%	D	Orange	(255,195,51)	#ffc333
P2-004	39.53672	-104.903915	79%	B	Light Green	(167,227,50)	#a7e332
P2-005	39.536701	-104.903839	67%	C	Yellow	(251,251,29)	#fbfb1d
P2-006	39.536736	-104.903786	51%	F	Red	(218,40,40)	#da2828
P2-007	39.536709	-104.903664	72%	C	Yellow	(251,251,29)	#fbfb1d
P2-008	39.536705	-104.903656	78%	B	Light Green	(167,227,50)	#a7e332
P2-009	39.536701	-104.903587	59%	D	Orange	(255,195,51)	#ffc333
P2-010	39.53672	-104.903481	60%	D	Orange	(255,195,51)	#ffc333
P2-011	39.536713	-104.903442	53%	F	Red	(218,40,40)	#da2828
P2-012	39.536697	-104.903358	92%	A	Dark Green	(85,157,91)	#559d5b
P2-013	39.536686	-104.903275	47%	F	Red	(218,40,40)	#da2828
P2-014	39.53669	-104.903229	69%	C	Yellow	(251,251,29)	#fbfb1d
P2-015	39.53669	-104.903168	51%	F	Red	(218,40,40)	#da2828
P2-016	39.536659	-104.903015	47%	F	Red	(218,40,40)	#da2828
P2-017	39.536713	-104.902992	45%	F	Red	(218,40,40)	#da2828
P2-018	39.536694	-104.902946	56%	F	Red	(218,40,40)	#da2828
P2-019	39.536686	-104.90287	51%	F	Red	(218,40,40)	#da2828
P2-020	39.536701	-104.902802	57%	F	Red	(218,40,40)	#da2828
P2-021	39.536697	-104.902718	62%	D	Orange	(255,195,51)	#ffc333
P2-022	39.536716	-104.902641	62%	D	Orange	(255,195,51)	#ffc333
P2-023	39.536686	-104.902565	90%	A	Dark Green	(85,157,91)	#559d5b
P2-024	39.536678	-104.902466	88%	A	Dark Green	(85,157,91)	#559d5b
P2-025	39.536755	-104.902412	94%	A	Dark Green	(85,157,91)	#559d5b
P2-026	39.536743	-104.902557	85%	A	Dark Green	(85,157,91)	#559d5b
P2-027	39.536747	-104.902504	76%	B	Light Green	(167,227,50)	#a7e332
P2-028	39.536766	-104.902458	66%	D	Orange	(255,195,51)	#ffc333
P2-029	39.536793	-104.902405	61%	D	Orange	(255,195,51)	#ffc333
P2-030	39.536808	-104.902328	80%	B	Light Green	(167,227,50)	#a7e332
P2-031	39.536888	-104.902306	62%	D	Orange	(255,195,51)	#ffc333
P2-032	39.536953	-104.90229	47%	F	Red	(218,40,40)	#da2828
P2-033	39.537003	-104.902321	51%	F	Red	(218,40,40)	#da2828
P2-034	39.537067	-104.90229	47%	F	Red	(218,40,40)	#da2828
P2-035	39.537132	-104.902298	43%	F	Red	(218,40,40)	#da2828
P2-036	39.537182	-104.902328	53%	F	Red	(218,40,40)	#da2828
P2-037	39.537224	-104.902306	44%	F	Red	(218,40,40)	#da2828
P2-038	39.537289	-104.902298	48%	F	Red	(218,40,40)	#da2828
P2-039	39.537319	-104.902283	53%	F	Red	(218,40,40)	#da2828
P2-040	39.537399	-104.90229	60%	D	Orange	(255,195,51)	#ffc333
P2-041	39.537449	-104.902306	61%	D	Orange	(255,195,51)	#ffc333
P2-042	39.537495	-104.902313	78%	B	Light Green	(167,227,50)	#a7e332
P2-043	39.537552	-104.902351	87%	A	Dark Green	(85,157,91)	#559d5b
P2-044	39.537621	-104.90239	77%	B	Light Green	(167,227,50)	#a7e332
P2-045	39.537613	-104.902435	89%	A	Dark Green	(85,157,91)	#559d5b
P2-046	39.537685	-104.902435	66%	D	Orange	(255,195,51)	#ffc333
P2-047	39.537849	-104.902412	48%	F	Red	(218,40,40)	#da2828
P2-048	39.537899	-104.902382	54%	F	Red	(218,40,40)	#da2828

P2-049	39.537842	-104.90226	88%	A	Dark Green	(85,157,91)	#559d5b
P2-050	39.537907	-104.902328	63%	D	Orange	(255,195,51)	#ffc333
P2-051	39.537926	-104.902267	76%	B	Light Green	(167,227,50)	#a7e332
P2-052	39.537971	-104.902222	76%	B	Light Green	(167,227,50)	#a7e332
P2-053	39.53804	-104.902168	51%	F	Red	(218,40,40)	#da2828
P2-054	39.538078	-104.902153	51%	F	Red	(218,40,40)	#da2828
P2-055	39.538139	-104.902138	45%	F	Red	(218,40,40)	#da2828
P2-056	39.538193	-104.90213	54%	F	Red	(218,40,40)	#da2828
P2-057	39.538242	-104.902084	60%	D	Orange	(255,195,51)	#ffc333
P2-058	39.538307	-104.902069	63%	D	Orange	(255,195,51)	#ffc333
P2-059	39.538349	-104.902046	90%	A	Dark Green	(85,157,91)	#559d5b
P2-060	39.538395	-104.902016	56%	F	Red	(218,40,40)	#da2828
P2-061	39.538464	-104.90197	62%	D	Orange	(255,195,51)	#ffc333
P2-062	39.538521	-104.901993	67%	C	Yellow	(251,251,29)	#fbfb1d
P2-063	39.53857	-104.902016	76%	B	Light Green	(167,227,50)	#a7e332
P2-064	39.538605	-104.902031	65%	D	Orange	(255,195,51)	#ffc333
P2-065	39.538639	-104.902023	64%	D	Orange	(255,195,51)	#ffc333
P2-066	39.538628	-104.901962	42%	F	Red	(218,40,40)	#da2828
P2-067	39.538673	-104.901894	39%	F	Red	(218,40,40)	#da2828
P2-068	39.538696	-104.90184	53%	F	Red	(218,40,40)	#da2828
P2-069	39.538738	-104.901756	48%	F	Red	(218,40,40)	#da2828
P2-070	39.538795	-104.901733	42%	F	Red	(218,40,40)	#da2828
P2-071	39.538837	-104.901711	49%	F	Red	(218,40,40)	#da2828
P2-072	39.538895	-104.901657	58%	F	Red	(218,40,40)	#da2828
P2-073	39.538933	-104.901611	36%	F	Red	(218,40,40)	#da2828
P2-074	39.538986	-104.901581	65%	D	Orange	(255,195,51)	#ffc333
P2-075	39.53904	-104.90152	49%	F	Red	(218,40,40)	#da2828
P2-076	39.539085	-104.901489	41%	F	Red	(218,40,40)	#da2828
P2-077	39.539112	-104.901436	52%	F	Red	(218,40,40)	#da2828
P2-078	39.539146	-104.90139	42%	F	Red	(218,40,40)	#da2828
P2-079	39.539207	-104.901367	42%	F	Red	(218,40,40)	#da2828
P2-080	39.53923	-104.901299	53%	F	Red	(218,40,40)	#da2828
P2-081	39.539268	-104.901268	49%	F	Red	(218,40,40)	#da2828
P2-082	39.539608	-104.90081	48%	F	Red	(218,40,40)	#da2828
P2-083	39.539669	-104.900787	48%	F	Red	(218,40,40)	#da2828
P2-084	39.5397	-104.900711	48%	F	Red	(218,40,40)	#da2828
P2-085	39.539738	-104.900673	64%	D	Orange	(255,195,51)	#ffc333
P2-086	39.539761	-104.90062	68%	C	Yellow	(251,251,29)	#fbfb1d
P2-087	39.539803	-104.900574	70%	C	Yellow	(251,251,29)	#fbfb1d
P2-088	39.539864	-104.900513	48%	F	Red	(218,40,40)	#da2828
P2-089	39.539898	-104.900475	49%	F	Red	(218,40,40)	#da2828
P2-090	39.53994	-104.900421	52%	F	Red	(218,40,40)	#da2828
P2-091	39.539955	-104.90036	40%	F	Red	(218,40,40)	#da2828
P2-092	39.540279	-104.89994	64%	D	Orange	(255,195,51)	#ffc333
P2-093	39.540283	-104.899895	52%	F	Red	(218,40,40)	#da2828
P2-094	39.540344	-104.899841	55%	F	Red	(218,40,40)	#da2828
P2-095	39.540352	-104.899788	52%	F	Red	(218,40,40)	#da2828
P2-096	39.540424	-104.89975	64%	D	Orange	(255,195,51)	#ffc333
P2-097	39.540455	-104.899681	81%	B	Light Green	(167,227,50)	#a7e332
P2-098	39.540485	-104.899643	65%	D	Orange	(255,195,51)	#ffc333
P2-099	39.540512	-104.899567	84%	A	Dark Green	(85,157,91)	#559d5b
P2-100	39.540565	-104.899551	70%	C	Yellow	(251,251,29)	#fbfb1d
P2-101	39.540585	-104.899498	62%	D	Orange	(255,195,51)	#ffc333
P2-102	39.54063	-104.899429	66%	D	Orange	(255,195,51)	#ffc333
P2-103	39.540665	-104.899376	65%	D	Orange	(255,195,51)	#ffc333
P2-104	39.54071	-104.899345	67%	C	Yellow	(251,251,29)	#fbfb1d
P2-105	39.540726	-104.899254	64%	D	Orange	(255,195,51)	#ffc333
P2-106	39.540794	-104.899231	72%	C	Yellow	(251,251,29)	#fbfb1d
P2-107	39.540829	-104.899193	54%	F	Red	(218,40,40)	#da2828

P2-108	39.540848	-104.899124	68%	C	Yellow	(251,251,29)	#fbfb1d
P2-109	39.540874	-104.899063	82%	B	Light Green	(167,227,50)	#a7e332
P2-110	39.540916	-104.899017	78%	B	Light Green	(167,227,50)	#a7e332
P2-111	39.540939	-104.898933	54%	F	Red	(218,40,40)	#da2828
P2-112	39.540981	-104.89888	79%	B	Light Green	(167,227,50)	#a7e332
P2-113	39.541031	-104.898834	69%	C	Yellow	(251,251,29)	#fbfb1d
P2-114	39.541073	-104.898788	68%	C	Yellow	(251,251,29)	#fbfb1d
P2-115	39.541092	-104.898727	92%	A	Dark Green	(85,157,91)	#559d5b
P2-116	39.541149	-104.898674	50%	F	Red	(218,40,40)	#da2828
P2-117	39.541183	-104.898643	90%	A	Dark Green	(85,157,91)	#559d5b
P2-118	39.541218	-104.89859	69%	C	Yellow	(251,251,29)	#fbfb1d
P2-119	39.541248	-104.898514	67%	C	Yellow	(251,251,29)	#fbfb1d
P2-120	39.541286	-104.898483	62%	D	Orange	(255,195,51)	#ffc333
P2-121	39.541336	-104.89843	64%	D	Orange	(255,195,51)	#ffc333
P2-122	39.541367	-104.898392	80%	B	Light Green	(167,227,50)	#a7e332
P2-123	39.541409	-104.898323	91%	A	Dark Green	(85,157,91)	#559d5b
P2-124	39.541439	-104.89827	72%	C	Yellow	(251,251,29)	#fbfb1d
P2-125	39.541481	-104.898239	64%	D	Orange	(255,195,51)	#ffc333
P2-126	39.541512	-104.898178	70%	C	Yellow	(251,251,29)	#fbfb1d
P2-127	39.541557	-104.898125	78%	B	Light Green	(167,227,50)	#a7e332
P2-128	39.54158	-104.898071	67%	C	Yellow	(251,251,29)	#fbfb1d
P2-129	39.541607	-104.898026	86%	A	Dark Green	(85,157,91)	#559d5b
P2-130	39.541645	-104.897972	66%	D	Orange	(255,195,51)	#ffc333
P2-131	39.541683	-104.897934	88%	A	Dark Green	(85,157,91)	#559d5b
P2-132	39.54171	-104.897888	66%	D	Orange	(255,195,51)	#ffc333
P2-133	39.541763	-104.897858	67%	D	Orange	(255,195,51)	#ffc333
P2-134	39.541779	-104.897812	69%	C	Yellow	(251,251,29)	#fbfb1d
P2-135	39.541348	-104.898056	60%	D	Orange	(255,195,51)	#ffc333
P2-136	39.541328	-104.898117	53%	F	Red	(218,40,40)	#da2828
P2-137	39.541283	-104.89817	71%	C	Yellow	(251,251,29)	#fbfb1d
P2-138	39.541252	-104.898239	62%	D	Orange	(255,195,51)	#ffc333
P2-139	39.541203	-104.8983	58%	F	Red	(218,40,40)	#da2828
P2-140	39.541176	-104.898361	62%	D	Orange	(255,195,51)	#ffc333
P2-141	39.541126	-104.898392	58%	F	Red	(218,40,40)	#da2828
P2-142	39.541107	-104.898445	62%	D	Orange	(255,195,51)	#ffc333
P2-143	39.54108	-104.898506	76%	B	Light Green	(167,227,50)	#a7e332
P2-144	39.541027	-104.89856	61%	D	Orange	(255,195,51)	#ffc333
P2-145	39.54097	-104.898605	34%	F	Red	(218,40,40)	#da2828
P2-146	39.540943	-104.898659	66%	D	Orange	(255,195,51)	#ffc333
P2-147	39.540905	-104.898682	58%	F	Red	(218,40,40)	#da2828
P2-148	39.540882	-104.898743	47%	F	Red	(218,40,40)	#da2828
P2-149	39.540829	-104.898773	67%	C	Yellow	(251,251,29)	#fbfb1d
P2-150	39.540791	-104.898834	62%	D	Orange	(255,195,51)	#ffc333
P2-151	39.540756	-104.898888	62%	D	Orange	(255,195,51)	#ffc333
P2-152	39.540718	-104.898926	65%	D	Orange	(255,195,51)	#ffc333
P2-153	39.540676	-104.899002	62%	D	Orange	(255,195,51)	#ffc333
P2-154	39.540649	-104.89904	63%	D	Orange	(255,195,51)	#ffc333
P2-155	39.540611	-104.899109	66%	D	Orange	(255,195,51)	#ffc333
P2-156	39.540577	-104.899178	62%	D	Orange	(255,195,51)	#ffc333
P2-157	39.540516	-104.899208	58%	F	Red	(218,40,40)	#da2828
P2-158	39.540478	-104.899277	67%	D	Orange	(255,195,51)	#ffc333
P2-159	39.540489	-104.899361	63%	D	Orange	(255,195,51)	#ffc333
P2-160	39.540428	-104.899376	86%	A	Dark Green	(85,157,91)	#559d5b
P2-161	39.540417	-104.899406	53%	F	Red	(218,40,40)	#da2828
P2-162	39.54034	-104.899445	62%	D	Orange	(255,195,51)	#ffc333
P2-163	39.540287	-104.899574	64%	D	Orange	(255,195,51)	#ffc333
P2-164	39.540264	-104.899612	64%	D	Orange	(255,195,51)	#ffc333
P2-165	39.54026	-104.899643	62%	D	Orange	(255,195,51)	#ffc333
P2-166	39.540203	-104.899788	63%	D	Orange	(255,195,51)	#ffc333

P2-167	39.540169	-104.899742	72%	C	Yellow	(251,251,29)	#fbfb1d
P2-168	39.540123	-104.899765	66%	D	Orange	(255,195,51)	#ffc333
P2-169	39.540085	-104.899796	68%	C	Yellow	(251,251,29)	#fbfb1d
P2-170	39.540047	-104.899811	76%	B	Light Green	(167,227,50)	#a7e332
P2-171	39.540005	-104.899818	81%	B	Light Green	(167,227,50)	#a7e332
P2-172	39.539951	-104.899796	76%	B	Light Green	(167,227,50)	#a7e332
P2-173	39.539925	-104.899734	89%	A	Dark Green	(85,157,91)	#559d5b
P2-174	39.539883	-104.899712	92%	A	Dark Green	(85,157,91)	#559d5b
P2-175	39.539848	-104.899673	83%	B	Light Green	(167,227,50)	#a7e332
P2-176	39.539822	-104.899559	90%	A	Dark Green	(85,157,91)	#559d5b
P2-177	39.539822	-104.8993	77%	B	Light Green	(167,227,50)	#a7e332
P2-178	39.539783	-104.899361	84%	B	Light Green	(167,227,50)	#a7e332
P2-179	39.539707	-104.899437	84%	B	Light Green	(167,227,50)	#a7e332
P2-180	39.539604	-104.899399	92%	A	Dark Green	(85,157,91)	#559d5b
P2-181	39.539585	-104.899376	78%	B	Light Green	(167,227,50)	#a7e332
P2-182	39.539558	-104.899323	73%	C	Yellow	(251,251,29)	#fbfb1d
P2-183	39.53952	-104.899292	76%	B	Light Green	(167,227,50)	#a7e332
P2-184	39.53949	-104.899246	81%	B	Light Green	(167,227,50)	#a7e332
P2-185	39.539459	-104.899178	76%	B	Light Green	(167,227,50)	#a7e332
P2-186	39.539433	-104.899147	96%	A	Dark Green	(85,157,91)	#559d5b
P2-187	39.539371	-104.899094	87%	A	Dark Green	(85,157,91)	#559d5b
P2-188	39.53933	-104.899071	87%	A	Dark Green	(85,157,91)	#559d5b
P2-189	39.53933	-104.898964	80%	B	Light Green	(167,227,50)	#a7e332
P2-190	39.539299	-104.898911	91%	A	Dark Green	(85,157,91)	#559d5b
P2-191	39.539337	-104.898849	85%	A	Dark Green	(85,157,91)	#559d5b
P2-192	39.539333	-104.898834	87%	A	Dark Green	(85,157,91)	#559d5b
P2-193	39.539341	-104.898758	62%	D	Orange	(255,195,51)	#ffc333
P2-194	39.539318	-104.898666	58%	F	Red	(218,40,40)	#da2828
P2-195	39.53931	-104.898651	76%	B	Light Green	(167,227,50)	#a7e332
P2-196	39.539024	-104.898506	85%	A	Dark Green	(85,157,91)	#559d5b
P2-197	39.538998	-104.898483	85%	A	Dark Green	(85,157,91)	#559d5b
P2-198	39.538975	-104.898476	85%	A	Dark Green	(85,157,91)	#559d5b
P2-199	39.53891	-104.898514	83%	B	Light Green	(167,227,50)	#a7e332
P2-200	39.538868	-104.898438	54%	F	Red	(218,40,40)	#da2828
P2-201	39.53883	-104.89843	63%	D	Orange	(255,195,51)	#ffc333
P2-202	39.538773	-104.898384	58%	F	Red	(218,40,40)	#da2828
P2-203	39.538746	-104.898308	53%	F	Red	(218,40,40)	#da2828
P2-204	39.538696	-104.898277	40%	F	Red	(218,40,40)	#da2828
P2-205	39.538658	-104.898247	35%	F	Red	(218,40,40)	#da2828
P2-206	39.538624	-104.898186	68%	C	Yellow	(251,251,29)	#fbfb1d
P2-207	39.538593	-104.898117	39%	F	Red	(218,40,40)	#da2828
P2-208	39.538528	-104.898071	37%	F	Red	(218,40,40)	#da2828
P2-209	39.538486	-104.898048	55%	F	Red	(218,40,40)	#da2828
P2-210	39.538464	-104.898003	92%	A	Dark Green	(85,157,91)	#559d5b
P2-211	39.538445	-104.897964	80%	B	Light Green	(167,227,50)	#a7e332
P2-212	39.53841	-104.897911	86%	A	Dark Green	(85,157,91)	#559d5b
P2-213	39.538383	-104.897873	63%	D	Orange	(255,195,51)	#ffc333
P2-214	39.538353	-104.897812	65%	D	Orange	(255,195,51)	#ffc333
P2-215	39.538322	-104.897804	77%	B	Light Green	(167,227,50)	#a7e332
P2-216	39.538311	-104.897713	85%	A	Dark Green	(85,157,91)	#559d5b
P2-217	39.53828	-104.897644	72%	C	Yellow	(251,251,29)	#fbfb1d
P2-218	39.538067	-104.897743	78%	B	Light Green	(167,227,50)	#a7e332
P2-219	39.538101	-104.897789	58%	F	Red	(218,40,40)	#da2828
P2-220	39.538136	-104.897842	60%	D	Orange	(255,195,51)	#ffc333
P2-221	39.538174	-104.897888	63%	D	Orange	(255,195,51)	#ffc333
P2-222	39.538197	-104.897926	88%	A	Dark Green	(85,157,91)	#559d5b
P2-223	39.538219	-104.898003	88%	A	Dark Green	(85,157,91)	#559d5b
P2-224	39.538208	-104.898087	98%	A	Dark Green	(85,157,91)	#559d5b
P2-225	39.538372	-104.898178	43%	F	Red	(218,40,40)	#da2828

P2-226	39.538395	-104.898247	58%	F	Red	(218,40,40)	#da2828
P2-227	39.538445	-104.898254	49%	F	Red	(218,40,40)	#da2828
P2-228	39.538502	-104.898315	51%	F	Red	(218,40,40)	#da2828
P2-229	39.53854	-104.898346	36%	F	Red	(218,40,40)	#da2828
P2-230	39.538918	-104.898857	56%	F	Red	(218,40,40)	#da2828
P2-231	39.538956	-104.898903	56%	F	Red	(218,40,40)	#da2828
P2-232	39.538982	-104.898933	53%	F	Red	(218,40,40)	#da2828
P2-233	39.539036	-104.89901	91%	A	Dark Green	(85,157,91)	#559d5b
P2-234	39.539066	-104.89904	57%	F	Red	(218,40,40)	#da2828
P2-235	39.539097	-104.899109	48%	F	Red	(218,40,40)	#da2828
P2-236	39.539154	-104.899155	54%	F	Red	(218,40,40)	#da2828
P2-237	39.539169	-104.899185	81%	B	Light Green	(167,227,50)	#a7e332
P2-238	39.539185	-104.899239	75%	C	Yellow	(251,251,29)	#fbfb1d
P2-239	39.539192	-104.899269	81%	B	Light Green	(167,227,50)	#a7e332
P2-240	39.539177	-104.899338	79%	B	Light Green	(167,227,50)	#a7e332
P2-241	39.539139	-104.899368	85%	A	Dark Green	(85,157,91)	#559d5b
P2-242	39.539124	-104.899391	86%	A	Dark Green	(85,157,91)	#559d5b
P2-243	39.539188	-104.899498	76%	B	Light Green	(167,227,50)	#a7e332
P2-244	39.539253	-104.899467	81%	B	Light Green	(167,227,50)	#a7e332
P2-245	39.539227	-104.899445	62%	D	Orange	(255,195,51)	#ffc333
P2-246	39.539268	-104.899391	88%	A	Dark Green	(85,157,91)	#559d5b
P2-247	39.539356	-104.899399	88%	A	Dark Green	(85,157,91)	#559d5b
P2-248	39.539394	-104.899429	77%	B	Light Green	(167,227,50)	#a7e332
P2-249	39.539425	-104.89949	58%	F	Red	(218,40,40)	#da2828
P2-250	39.539478	-104.899506	57%	F	Red	(218,40,40)	#da2828
P2-251	39.539486	-104.899628	50%	F	Red	(218,40,40)	#da2828
P2-252	39.539539	-104.899605	71%	C	Yellow	(251,251,29)	#fbfb1d
P2-253	39.539581	-104.899658	49%	F	Red	(218,40,40)	#da2828
P2-254	39.539608	-104.899689	61%	D	Orange	(255,195,51)	#ffc333
P2-255	39.539635	-104.899719	49%	F	Red	(218,40,40)	#da2828
P2-256	39.539684	-104.899803	75%	B	Light Green	(167,227,50)	#a7e332
P2-257	39.539703	-104.899841	68%	C	Yellow	(251,251,29)	#fbfb1d
P2-258	39.539757	-104.899864	41%	F	Red	(218,40,40)	#da2828
P2-259	39.539761	-104.899925	55%	F	Red	(218,40,40)	#da2828
P2-260	39.539799	-104.899925	75%	B	Light Green	(167,227,50)	#a7e332
P2-261	39.539825	-104.900017	64%	D	Orange	(255,195,51)	#ffc333
P2-262	39.539829	-104.900085	65%	D	Orange	(255,195,51)	#ffc333
P2-263	39.539845	-104.900146	65%	D	Orange	(255,195,51)	#ffc333
P2-264	39.539867	-104.90023	70%	C	Yellow	(251,251,29)	#fbfb1d
P2-265	39.539845	-104.900269	91%	A	Dark Green	(85,157,91)	#559d5b
P2-266	39.539833	-104.900269	97%	A	Dark Green	(85,157,91)	#559d5b
P2-267	39.539783	-104.900253	64%	D	Orange	(255,195,51)	#ffc333
P2-268	39.53978	-104.900322	59%	F	Red	(218,40,40)	#da2828
P2-269	39.539772	-104.900375	66%	D	Orange	(255,195,51)	#ffc333
P2-270	39.539719	-104.900414	65%	D	Orange	(255,195,51)	#ffc333
P2-271	39.539673	-104.900436	48%	F	Red	(218,40,40)	#da2828
P2-272	39.539623	-104.90049	67%	C	Yellow	(251,251,29)	#fbfb1d
P2-273	39.539608	-104.900543	75%	C	Yellow	(251,251,29)	#fbfb1d
P2-274	39.539562	-104.900612	77%	B	Light Green	(167,227,50)	#a7e332
P2-275	39.539501	-104.900673	70%	C	Yellow	(251,251,29)	#fbfb1d
P2-276	39.539463	-104.900696	64%	D	Orange	(255,195,51)	#ffc333
P2-277	39.53944	-104.900764	59%	F	Red	(218,40,40)	#da2828
P2-278	39.539379	-104.900833	58%	F	Red	(218,40,40)	#da2828
P2-279	39.539341	-104.900871	76%	B	Light Green	(167,227,50)	#a7e332
P2-280	39.53931	-104.900932	63%	D	Orange	(255,195,51)	#ffc333
P2-281	39.539272	-104.900963	66%	D	Orange	(255,195,51)	#ffc333
P2-282	39.539234	-104.901009	45%	F	Red	(218,40,40)	#da2828
P2-283	39.539196	-104.901085	48%	F	Red	(218,40,40)	#da2828
P2-284	39.539165	-104.901123	79%	B	Light Green	(167,227,50)	#a7e332

P2-285	39.539104	-104.901184	58%	F	Red	(218,40,40)	#da2828
P2-286	39.539108	-104.901245	76%	B	Light Green	(167,227,50)	#a7e332
P2-287	39.539028	-104.901253	74%	C	Yellow	(251,251,29)	#fbfb1d
P2-288	39.538998	-104.901306	60%	D	Orange	(255,195,51)	#ffc333
P2-289	39.538952	-104.901375	62%	D	Orange	(255,195,51)	#ffc333
P2-290	39.538879	-104.901421	59%	F	Red	(218,40,40)	#da2828
P2-291	39.538822	-104.901436	75%	B	Light Green	(167,227,50)	#a7e332
P2-292	39.538757	-104.901428	84%	B	Light Green	(167,227,50)	#a7e332
P2-293	39.538712	-104.901405	78%	B	Light Green	(167,227,50)	#a7e332
P2-294	39.538666	-104.901413	91%	A	Dark Green	(85,157,91)	#559d5b
P2-295	39.542233	-104.889816	93%	A	Dark Green	(85,157,91)	#559d5b
P2-296	39.54216	-104.889816	65%	D	Orange	(255,195,51)	#ffc333
P2-297	39.542145	-104.889771	66%	D	Orange	(255,195,51)	#ffc333
P2-298	39.54213	-104.889725	80%	B	Light Green	(167,227,50)	#a7e332
P2-299	39.542133	-104.889694	89%	A	Dark Green	(85,157,91)	#559d5b
P2-300	39.542122	-104.889679	62%	D	Orange	(255,195,51)	#ffc333
P2-301	39.54213	-104.889648	98%	A	Dark Green	(85,157,91)	#559d5b
P2-302	39.542107	-104.88961	51%	F	Red	(218,40,40)	#da2828
P2-303	39.542118	-104.889565	45%	F	Red	(218,40,40)	#da2828
P2-304	39.542095	-104.889465	56%	F	Red	(218,40,40)	#da2828
P2-305	39.542099	-104.889412	78%	B	Light Green	(167,227,50)	#a7e332
P2-306	39.542122	-104.889351	97%	A	Dark Green	(85,157,91)	#559d5b
P2-307	39.54216	-104.889351	89%	A	Dark Green	(85,157,91)	#559d5b
P2-308	39.542095	-104.888847	68%	C	Yellow	(251,251,29)	#fbfb1d
P2-309	39.542072	-104.88884	71%	C	Yellow	(251,251,29)	#fbfb1d
P2-310	39.542038	-104.888794	54%	F	Red	(218,40,40)	#da2828
P2-311	39.542038	-104.888733	56%	F	Red	(218,40,40)	#da2828
P2-312	39.542023	-104.88868	72%	C	Yellow	(251,251,29)	#fbfb1d
P2-313	39.542007	-104.888618	67%	C	Yellow	(251,251,29)	#fbfb1d
P2-314	39.542015	-104.888535	89%	A	Dark Green	(85,157,91)	#559d5b
P2-315	39.542065	-104.888496	81%	B	Light Green	(167,227,50)	#a7e332
P2-316	39.54211	-104.888451	86%	A	Dark Green	(85,157,91)	#559d5b
P2-317	39.542057	-104.888252	89%	A	Dark Green	(85,157,91)	#559d5b
P2-318	39.542027	-104.888252	97%	A	Dark Green	(85,157,91)	#559d5b
P2-319	39.541988	-104.888191	94%	A	Dark Green	(85,157,91)	#559d5b
P2-320	39.541988	-104.888145	85%	A	Dark Green	(85,157,91)	#559d5b
P2-321	39.541714	-104.888474	92%	A	Dark Green	(85,157,91)	#559d5b
P2-322	39.541771	-104.888489	89%	A	Dark Green	(85,157,91)	#559d5b
P2-323	39.541794	-104.888481	87%	A	Dark Green	(85,157,91)	#559d5b
P2-324	39.541885	-104.888527	77%	B	Light Green	(167,227,50)	#a7e332
P2-325	39.541908	-104.888542	82%	B	Light Green	(167,227,50)	#a7e332
P2-326	39.541908	-104.888596	71%	C	Yellow	(251,251,29)	#fbfb1d
P2-327	39.541927	-104.888664	69%	C	Yellow	(251,251,29)	#fbfb1d
P2-328	39.541924	-104.888725	72%	C	Yellow	(251,251,29)	#fbfb1d
P2-329	39.541962	-104.888809	81%	B	Light Green	(167,227,50)	#a7e332
P2-330	39.541973	-104.88887	69%	C	Yellow	(251,251,29)	#fbfb1d
P2-331	39.541924	-104.888947	83%	B	Light Green	(167,227,50)	#a7e332
P3-001	39.53508	-104.897308	87%	A	Dark Green	(85,157,91)	#559d5b
P3-002	39.535194	-104.897476	44%	F	Red	(218,40,40)	#da2828
P3-003	39.53516	-104.897423	62%	D	Orange	(255,195,51)	#ffc333
P3-004	39.535172	-104.897324	61%	D	Orange	(255,195,51)	#ffc333
P3-005	39.535187	-104.897285	76%	B	Light Green	(167,227,50)	#a7e332
P3-006	39.535259	-104.897255	76%	B	Light Green	(167,227,50)	#a7e332
P3-007	39.535328	-104.897278	85%	A	Dark Green	(85,157,91)	#559d5b
P3-008	39.535355	-104.897263	79%	B	Light Green	(167,227,50)	#a7e332
P3-009	39.535431	-104.897285	71%	C	Yellow	(251,251,29)	#fbfb1d
P3-010	39.535473	-104.897263	72%	C	Yellow	(251,251,29)	#fbfb1d
P3-011	39.535545	-104.897293	65%	D	Orange	(255,195,51)	#ffc333
P3-012	39.535591	-104.897247	75%	C	Yellow	(251,251,29)	#fbfb1d

P3-013	39.535622	-104.897285	69%	C	Yellow	(251,251,29)	#fbfb1d
P3-014	39.535755	-104.897293	67%	D	Orange	(255,195,51)	#ffc333
P3-015	39.535797	-104.897263	67%	C	Yellow	(251,251,29)	#fbfb1d
P3-016	39.535831	-104.897263	91%	A	Dark Green	(85,157,91)	#559d5b
P3-017	39.535877	-104.897255	43%	F	Red	(218,40,40)	#da2828
P3-018	39.535931	-104.897263	69%	C	Yellow	(251,251,29)	#fbfb1d
P3-019	39.535999	-104.897301	68%	C	Yellow	(251,251,29)	#fbfb1d
P3-020	39.536037	-104.897354	90%	A	Dark Green	(85,157,91)	#559d5b
P3-021	39.536068	-104.8974	74%	C	Yellow	(251,251,29)	#fbfb1d
P3-022	39.536125	-104.897461	85%	A	Dark Green	(85,157,91)	#559d5b
P3-023	39.536179	-104.897484	90%	A	Dark Green	(85,157,91)	#559d5b
P3-024	39.536201	-104.897522	94%	A	Dark Green	(85,157,91)	#559d5b
P3-025	39.536228	-104.897606	89%	A	Dark Green	(85,157,91)	#559d5b
P3-026	39.536217	-104.897667	86%	A	Dark Green	(85,157,91)	#559d5b
P3-027	39.536232	-104.897774	87%	A	Dark Green	(85,157,91)	#559d5b
P3-028	39.536236	-104.897842	79%	B	Light Green	(167,227,50)	#a7e332
P3-029	39.536232	-104.897911	71%	C	Yellow	(251,251,29)	#fbfb1d
P3-030	39.536228	-104.897957	83%	B	Light Green	(167,227,50)	#a7e332
P3-031	39.536243	-104.898079	91%	A	Dark Green	(85,157,91)	#559d5b
P3-032	39.536251	-104.898178	76%	B	Light Green	(167,227,50)	#a7e332
P3-033	39.536243	-104.898239	78%	B	Light Green	(167,227,50)	#a7e332
P3-034	39.536297	-104.898277	81%	B	Light Green	(167,227,50)	#a7e332
P3-035	39.536247	-104.898354	66%	D	Orange	(255,195,51)	#ffc333
P3-036	39.536247	-104.898407	89%	A	Dark Green	(85,157,91)	#559d5b
P3-037	39.53624	-104.898468	88%	A	Dark Green	(85,157,91)	#559d5b
P3-038	39.536251	-104.898575	73%	C	Yellow	(251,251,29)	#fbfb1d
P3-039	39.536243	-104.898636	65%	D	Orange	(255,195,51)	#ffc333
P3-040	39.53624	-104.898689	71%	C	Yellow	(251,251,29)	#fbfb1d
P3-041	39.536243	-104.898735	71%	C	Yellow	(251,251,29)	#fbfb1d
P3-042	39.536224	-104.898849	76%	B	Light Green	(167,227,50)	#a7e332
P3-043	39.53624	-104.898911	67%	C	Yellow	(251,251,29)	#fbfb1d
P3-044	39.536236	-104.898972	84%	B	Light Green	(167,227,50)	#a7e332
P3-045	39.536446	-104.900299	58%	F	Red	(218,40,40)	#da2828
P3-046	39.536312	-104.90033	44%	F	Red	(218,40,40)	#da2828
P3-047	39.536301	-104.900429	67%	C	Yellow	(251,251,29)	#fbfb1d
P3-048	39.536331	-104.90052	47%	F	Red	(218,40,40)	#da2828
P3-049	39.536293	-104.900536	41%	F	Red	(218,40,40)	#da2828
P3-050	39.53632	-104.90062	83%	B	Light Green	(167,227,50)	#a7e332
P3-051	39.536297	-104.900726	73%	C	Yellow	(251,251,29)	#fbfb1d
P3-052	39.536278	-104.900734	83%	B	Light Green	(167,227,50)	#a7e332
P3-053	39.536312	-104.900841	86%	A	Dark Green	(85,157,91)	#559d5b
P3-054	39.536324	-104.900894	84%	B	Light Green	(167,227,50)	#a7e332
P3-055	39.536278	-104.90097	87%	A	Dark Green	(85,157,91)	#559d5b
P3-056	39.536324	-104.901054	85%	A	Dark Green	(85,157,91)	#559d5b
P3-057	39.536339	-104.901115	72%	C	Yellow	(251,251,29)	#fbfb1d
P3-058	39.536407	-104.901169	77%	B	Light Green	(167,227,50)	#a7e332
P3-059	39.536289	-104.901245	91%	A	Dark Green	(85,157,91)	#559d5b
P3-060	39.536282	-104.901314	88%	A	Dark Green	(85,157,91)	#559d5b
P3-061	39.536282	-104.90139	79%	B	Light Green	(167,227,50)	#a7e332
P3-062	39.536293	-104.901443	86%	A	Dark Green	(85,157,91)	#559d5b
P3-063	39.536278	-104.901474	86%	A	Dark Green	(85,157,91)	#559d5b
P3-064	39.536285	-104.901497	80%	B	Light Green	(167,227,50)	#a7e332
P3-065	39.536289	-104.901543	47%	F	Red	(218,40,40)	#da2828
P3-066	39.536289	-104.901596	46%	F	Red	(218,40,40)	#da2828
P3-067	39.536316	-104.901657	67%	C	Yellow	(251,251,29)	#fbfb1d
P3-068	39.536293	-104.901726	76%	B	Light Green	(167,227,50)	#a7e332
P3-069	39.536285	-104.901802	47%	F	Red	(218,40,40)	#da2828
P3-070	39.536289	-104.901848	72%	C	Yellow	(251,251,29)	#fbfb1d
P3-071	39.536282	-104.901939	72%	C	Yellow	(251,251,29)	#fbfb1d

P3-072	39.536221	-104.901993	72%	C	Yellow	(251,251,29)	#fbfb1d
P3-073	39.536171	-104.902069	98%	A	Dark Green	(85,157,91)	#559d5b
P3-074	39.536255	-104.902039	72%	C	Yellow	(251,251,29)	#fbfb1d
P3-075	39.536644	-104.900879	89%	A	Dark Green	(85,157,91)	#559d5b
P3-076	39.536625	-104.900818	86%	A	Dark Green	(85,157,91)	#559d5b
P3-077	39.536636	-104.900734	72%	C	Yellow	(251,251,29)	#fbfb1d
P3-078	39.53664	-104.900658	72%	C	Yellow	(251,251,29)	#fbfb1d
P3-079	39.536617	-104.900581	82%	B	Light Green	(167,227,50)	#a7e332
P3-080	39.536633	-104.900505	62%	D	Orange	(255,195,51)	#ffc333
P3-081	39.53664	-104.900452	72%	C	Yellow	(251,251,29)	#fbfb1d
P3-082	39.53664	-104.900375	62%	D	Orange	(255,195,51)	#ffc333
P3-083	39.536629	-104.900314	60%	D	Orange	(255,195,51)	#ffc333
P3-084	39.536644	-104.900253	51%	F	Red	(218,40,40)	#da2828
P3-085	39.536636	-104.900162	73%	C	Yellow	(251,251,29)	#fbfb1d
P3-086	39.536644	-104.900085	62%	D	Orange	(255,195,51)	#ffc333
P3-087	39.536663	-104.900017	64%	D	Orange	(255,195,51)	#ffc333
P3-088	39.536636	-104.899956	85%	A	Dark Green	(85,157,91)	#559d5b
P3-089	39.536648	-104.899864	87%	A	Dark Green	(85,157,91)	#559d5b
P3-090	39.536633	-104.899796	63%	D	Orange	(255,195,51)	#ffc333
P3-091	39.53664	-104.899727	61%	D	Orange	(255,195,51)	#ffc333
P3-092	39.536625	-104.899582	63%	D	Orange	(255,195,51)	#ffc333
P3-093	39.536633	-104.899513	63%	D	Orange	(255,195,51)	#ffc333
P3-094	39.536648	-104.899452	65%	D	Orange	(255,195,51)	#ffc333
P3-095	39.536652	-104.899399	96%	A	Dark Green	(85,157,91)	#559d5b
P3-096	39.536644	-104.899307	78%	B	Light Green	(167,227,50)	#a7e332
P3-097	39.536633	-104.899231	71%	C	Yellow	(251,251,29)	#fbfb1d
P3-098	39.53661	-104.899185	72%	C	Yellow	(251,251,29)	#fbfb1d
P3-099	39.536629	-104.899117	83%	B	Light Green	(167,227,50)	#a7e332
P3-100	39.536629	-104.899025	59%	D	Orange	(255,195,51)	#ffc333
P3-101	39.53664	-104.898949	75%	B	Light Green	(167,227,50)	#a7e332
P3-102	39.536636	-104.89888	71%	C	Yellow	(251,251,29)	#fbfb1d
P3-103	39.536648	-104.898827	65%	D	Orange	(255,195,51)	#ffc333
P3-104	39.536629	-104.89875	80%	B	Light Green	(167,227,50)	#a7e332
P3-105	39.536629	-104.898666	51%	F	Red	(218,40,40)	#da2828
P3-106	39.536648	-104.898621	65%	D	Orange	(255,195,51)	#ffc333
P3-107	39.536636	-104.898529	67%	C	Yellow	(251,251,29)	#fbfb1d
P3-108	39.536613	-104.898491	64%	D	Orange	(255,195,51)	#ffc333
P3-109	39.53664	-104.898407	77%	B	Light Green	(167,227,50)	#a7e332
P3-110	39.536633	-104.898354	91%	A	Dark Green	(85,157,91)	#559d5b
P3-111	39.536617	-104.898247	47%	F	Red	(218,40,40)	#da2828
P3-112	39.536613	-104.89817	90%	A	Dark Green	(85,157,91)	#559d5b
P3-113	39.536633	-104.898094	52%	F	Red	(218,40,40)	#da2828
P3-114	39.536606	-104.898026	79%	B	Light Green	(167,227,50)	#a7e332
P3-115	39.536633	-104.89798	52%	F	Red	(218,40,40)	#da2828
P3-116	39.536629	-104.897919	78%	B	Light Green	(167,227,50)	#a7e332
P3-117	39.536636	-104.89782	50%	F	Red	(218,40,40)	#da2828
P3-118	39.536617	-104.897781	85%	A	Dark Green	(85,157,91)	#559d5b
P3-119	39.536621	-104.894272	78%	B	Light Green	(167,227,50)	#a7e332
P3-120	39.536606	-104.894203	74%	C	Yellow	(251,251,29)	#fbfb1d
P3-121	39.536633	-104.89415	68%	C	Yellow	(251,251,29)	#fbfb1d
P3-122	39.536621	-104.894081	59%	D	Orange	(255,195,51)	#ffc333
P3-123	39.536613	-104.894012	58%	F	Red	(218,40,40)	#da2828
P3-124	39.536617	-104.893921	74%	C	Yellow	(251,251,29)	#fbfb1d
P3-125	39.536606	-104.893852	62%	D	Orange	(255,195,51)	#ffc333
P3-126	39.536591	-104.893776	89%	A	Dark Green	(85,157,91)	#559d5b
P3-127	39.53661	-104.89373	64%	D	Orange	(255,195,51)	#ffc333
P3-128	39.536598	-104.893654	87%	A	Dark Green	(85,157,91)	#559d5b
P3-129	39.536591	-104.893578	80%	B	Light Green	(167,227,50)	#a7e332
P3-130	39.536579	-104.893517	89%	A	Dark Green	(85,157,91)	#559d5b

P3-131	39.536579	-104.893463	73%	C	Yellow	(251,251,29)	#fbfb1d
P3-132	39.536572	-104.893364	42%	F	Red	(218,40,40)	#da2828
P3-133	39.536568	-104.89328	78%	B	Light Green	(167,227,50)	#a7e332
P3-134	39.536579	-104.893227	56%	F	Red	(218,40,40)	#da2828
P3-135	39.53656	-104.893181	87%	A	Dark Green	(85,157,91)	#559d5b
P3-136	39.536583	-104.892609	87%	A	Dark Green	(85,157,91)	#559d5b
P3-137	39.536591	-104.892548	62%	D	Orange	(255,195,51)	#ffc333
P3-138	39.536564	-104.892441	80%	B	Light Green	(167,227,50)	#a7e332
P3-139	39.536579	-104.89241	87%	A	Dark Green	(85,157,91)	#559d5b
P3-140	39.536568	-104.892319	55%	F	Red	(218,40,40)	#da2828
P3-141	39.536579	-104.892258	70%	C	Yellow	(251,251,29)	#fbfb1d
P3-142	39.536594	-104.892204	65%	D	Orange	(255,195,51)	#ffc333
P3-143	39.536583	-104.892143	78%	B	Light Green	(167,227,50)	#a7e332
P3-144	39.53656	-104.892067	91%	A	Dark Green	(85,157,91)	#559d5b
P3-145	39.53656	-104.891983	50%	F	Red	(218,40,40)	#da2828
P3-146	39.536552	-104.891891	77%	B	Light Green	(167,227,50)	#a7e332
P3-147	39.536579	-104.89183	87%	A	Dark Green	(85,157,91)	#559d5b
P3-148	39.536572	-104.891785	82%	B	Light Green	(167,227,50)	#a7e332
P3-149	39.536564	-104.891685	90%	A	Dark Green	(85,157,91)	#559d5b
P3-150	39.536572	-104.891617	63%	D	Orange	(255,195,51)	#ffc333
P3-151	39.536572	-104.891541	66%	D	Orange	(255,195,51)	#ffc333
P3-152	39.536568	-104.891472	53%	F	Red	(218,40,40)	#da2828
P3-153	39.536579	-104.891411	64%	D	Orange	(255,195,51)	#ffc333
P3-154	39.536564	-104.891357	45%	F	Red	(218,40,40)	#da2828
P3-155	39.536549	-104.891273	54%	F	Red	(218,40,40)	#da2828
P3-156	39.536568	-104.891205	62%	D	Orange	(255,195,51)	#ffc333
P3-157	39.53656	-104.891121	57%	F	Red	(218,40,40)	#da2828
P3-158	39.536583	-104.891075	73%	C	Yellow	(251,251,29)	#fbfb1d
P3-159	39.536556	-104.891006	69%	C	Yellow	(251,251,29)	#fbfb1d
P3-160	39.53656	-104.8909	71%	C	Yellow	(251,251,29)	#fbfb1d
P3-161	39.536575	-104.890846	37%	F	Red	(218,40,40)	#da2828
P3-162	39.536564	-104.8908	63%	D	Orange	(255,195,51)	#ffc333
P3-163	39.53653	-104.890732	71%	C	Yellow	(251,251,29)	#fbfb1d
P3-164	39.536564	-104.890656	64%	D	Orange	(255,195,51)	#ffc333
P3-165	39.536564	-104.890572	44%	F	Red	(218,40,40)	#da2828
P3-166	39.53656	-104.890526	54%	F	Red	(218,40,40)	#da2828
P3-167	39.536552	-104.890457	77%	B	Light Green	(167,227,50)	#a7e332
P3-168	39.536583	-104.890312	67%	C	Yellow	(251,251,29)	#fbfb1d
P3-169	39.536568	-104.890305	76%	B	Light Green	(167,227,50)	#a7e332
P3-170	39.536564	-104.890221	69%	C	Yellow	(251,251,29)	#fbfb1d
P3-171	39.536556	-104.89016	61%	D	Orange	(255,195,51)	#ffc333
P3-172	39.53656	-104.890091	64%	D	Orange	(255,195,51)	#ffc333
P3-173	39.536556	-104.890015	76%	B	Light Green	(167,227,50)	#a7e332
P3-174	39.536556	-104.889946	66%	D	Orange	(255,195,51)	#ffc333
P3-175	39.536545	-104.889885	89%	A	Dark Green	(85,157,91)	#559d5b
P3-176	39.538361	-104.888474	63%	D	Orange	(255,195,51)	#ffc333
P3-177	39.538395	-104.888481	45%	F	Red	(218,40,40)	#da2828
P3-178	39.538368	-104.888428	66%	D	Orange	(255,195,51)	#ffc333
P3-179	39.538376	-104.888344	73%	C	Yellow	(251,251,29)	#fbfb1d
P3-180	39.538452	-104.888329	79%	B	Light Green	(167,227,50)	#a7e332
P3-181	39.538471	-104.88826	56%	F	Red	(218,40,40)	#da2828
P3-182	39.538506	-104.888344	60%	D	Orange	(255,195,51)	#ffc333
P3-183	39.538521	-104.888245	59%	F	Red	(218,40,40)	#da2828
P3-184	39.538509	-104.888214	54%	F	Red	(218,40,40)	#da2828
P3-185	39.538532	-104.888084	73%	C	Yellow	(251,251,29)	#fbfb1d
P3-186	39.538551	-104.888016	79%	B	Light Green	(167,227,50)	#a7e332
P3-187	39.538597	-104.887955	72%	C	Yellow	(251,251,29)	#fbfb1d
P3-188	39.538628	-104.887901	63%	D	Orange	(255,195,51)	#ffc333
P3-189	39.53867	-104.887871	81%	B	Light Green	(167,227,50)	#a7e332

P3-190	39.538715	-104.887825	74%	C	Yellow	(251,251,29)	#fbfb1d
P3-191	39.538746	-104.887764	71%	C	Yellow	(251,251,29)	#fbfb1d
P3-192	39.53883	-104.887741	75%	B	Light Green	(167,227,50)	#a7e332
P3-193	39.538845	-104.887665	76%	B	Light Green	(167,227,50)	#a7e332
P3-194	39.538906	-104.887642	74%	C	Yellow	(251,251,29)	#fbfb1d
P3-195	39.53896	-104.887634	65%	D	Orange	(255,195,51)	#ffc333
P3-196	39.539005	-104.887566	66%	D	Orange	(255,195,51)	#ffc333
P3-197	39.53904	-104.887535	65%	D	Orange	(255,195,51)	#ffc333
P3-198	39.539104	-104.887497	52%	F	Red	(218,40,40)	#da2828
P3-199	39.539173	-104.887535	63%	D	Orange	(255,195,51)	#ffc333
P3-200	39.539223	-104.88752	59%	D	Orange	(255,195,51)	#ffc333
P3-201	39.539288	-104.88755	56%	F	Red	(218,40,40)	#da2828
P3-202	39.539337	-104.887573	49%	F	Red	(218,40,40)	#da2828
P3-203	39.539356	-104.887619	64%	D	Orange	(255,195,51)	#ffc333
P3-204	39.539429	-104.887642	53%	F	Red	(218,40,40)	#da2828
P3-205	39.539467	-104.887703	65%	D	Orange	(255,195,51)	#ffc333
P3-206	39.539501	-104.887756	64%	D	Orange	(255,195,51)	#ffc333
P3-207	39.539543	-104.887756	65%	D	Orange	(255,195,51)	#ffc333
P3-208	39.539612	-104.887802	65%	D	Orange	(255,195,51)	#ffc333
P3-209	39.539642	-104.88781	56%	F	Red	(218,40,40)	#da2828
P3-210	39.5397	-104.887833	62%	D	Orange	(255,195,51)	#ffc333
P3-211	39.540207	-104.88781	64%	D	Orange	(255,195,51)	#ffc333
P3-212	39.540253	-104.887787	69%	C	Yellow	(251,251,29)	#fbfb1d
P3-213	39.540283	-104.887741	68%	C	Yellow	(251,251,29)	#fbfb1d
P3-214	39.540333	-104.887688	91%	A	Dark Green	(85,157,91)	#559d5b
P3-215	39.518131	-104.897758	92%	A	Dark Green	(85,157,91)	#559d5b
P3-216	39.536785	-104.901962	90%	A	Dark Green	(85,157,91)	#559d5b
P3-217	39.536724	-104.901894	68%	C	Yellow	(251,251,29)	#fbfb1d
P4-001	39.539978	-104.90036	80%	B	Light Green	(167,227,50)	#a7e332
P4-002	39.540073	-104.900368	76%	B	Light Green	(167,227,50)	#a7e332
P4-003	39.540085	-104.900352	89%	A	Dark Green	(85,157,91)	#559d5b
P4-004	39.540115	-104.900383	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-005	39.54018	-104.900383	81%	B	Light Green	(167,227,50)	#a7e332
P4-006	39.540226	-104.900398	68%	C	Yellow	(251,251,29)	#fbfb1d
P4-007	39.540291	-104.900414	58%	F	Red	(218,40,40)	#da2828
P4-008	39.540318	-104.900482	70%	C	Yellow	(251,251,29)	#fbfb1d
P4-009	39.540356	-104.900528	70%	C	Yellow	(251,251,29)	#fbfb1d
P4-010	39.54039	-104.900558	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-011	39.54044	-104.90062	60%	D	Orange	(255,195,51)	#ffc333
P4-012	39.540462	-104.900665	81%	B	Light Green	(167,227,50)	#a7e332
P4-013	39.540459	-104.900703	65%	D	Orange	(255,195,51)	#ffc333
P4-014	39.540428	-104.900719	62%	D	Orange	(255,195,51)	#ffc333
P4-015	39.540489	-104.900726	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-016	39.540466	-104.900772	75%	C	Yellow	(251,251,29)	#fbfb1d
P4-017	39.540485	-104.900803	66%	D	Orange	(255,195,51)	#ffc333
P4-018	39.540558	-104.900826	72%	C	Yellow	(251,251,29)	#fbfb1d
P4-019	39.540569	-104.900871	72%	C	Yellow	(251,251,29)	#fbfb1d
P4-020	39.540623	-104.900986	71%	C	Yellow	(251,251,29)	#fbfb1d
P4-021	39.540642	-104.900993	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-022	39.54068	-104.901039	68%	C	Yellow	(251,251,29)	#fbfb1d
P4-023	39.54071	-104.901085	87%	A	Dark Green	(85,157,91)	#559d5b
P4-024	39.540749	-104.901085	71%	C	Yellow	(251,251,29)	#fbfb1d
P4-025	39.54081	-104.901123	52%	F	Red	(218,40,40)	#da2828
P4-026	39.540863	-104.901108	71%	C	Yellow	(251,251,29)	#fbfb1d
P4-027	39.540932	-104.901123	64%	D	Orange	(255,195,51)	#ffc333
P4-028	39.540951	-104.901115	67%	C	Yellow	(251,251,29)	#fbfb1d
P4-029	39.541027	-104.901161	79%	B	Light Green	(167,227,50)	#a7e332
P4-030	39.541039	-104.901161	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-031	39.541088	-104.901062	83%	B	Light Green	(167,227,50)	#a7e332

P4-032	39.541138	-104.901039	80%	B	Light Green	(167,227,50)	#a7e332
P4-033	39.541183	-104.901062	72%	C	Yellow	(251,251,29)	#fbfb1d
P4-034	39.541256	-104.901054	82%	B	Light Green	(167,227,50)	#a7e332
P4-035	39.541325	-104.901024	70%	C	Yellow	(251,251,29)	#fbfb1d
P4-036	39.541359	-104.900993	61%	D	Orange	(255,195,51)	#ffc333
P4-037	39.541431	-104.900978	56%	F	Red	(218,40,40)	#da2828
P4-038	39.541466	-104.900978	43%	F	Red	(218,40,40)	#da2828
P4-039	39.541523	-104.90097	58%	F	Red	(218,40,40)	#da2828
P4-040	39.54158	-104.900948	62%	D	Orange	(255,195,51)	#ffc333
P4-041	39.541634	-104.900955	47%	F	Red	(218,40,40)	#da2828
P4-042	39.541695	-104.90097	74%	C	Yellow	(251,251,29)	#fbfb1d
P4-043	39.541748	-104.900963	60%	D	Orange	(255,195,51)	#ffc333
P4-044	39.541782	-104.900993	75%	C	Yellow	(251,251,29)	#fbfb1d
P4-045	39.541843	-104.900978	80%	B	Light Green	(167,227,50)	#a7e332
P4-046	39.541885	-104.900978	70%	C	Yellow	(251,251,29)	#fbfb1d
P4-047	39.541958	-104.90097	57%	F	Red	(218,40,40)	#da2828
P4-048	39.542023	-104.90097	88%	A	Dark Green	(85,157,91)	#559d5b
P4-049	39.542065	-104.90097	82%	B	Light Green	(167,227,50)	#a7e332
P4-050	39.542122	-104.900978	76%	B	Light Green	(167,227,50)	#a7e332
P4-051	39.542187	-104.901009	72%	C	Yellow	(251,251,29)	#fbfb1d
P4-052	39.542221	-104.901047	60%	D	Orange	(255,195,51)	#ffc333
P4-053	39.542282	-104.90107	45%	F	Red	(218,40,40)	#da2828
P4-054	39.542347	-104.901054	85%	A	Dark Green	(85,157,91)	#559d5b
P4-055	39.542397	-104.901085	75%	C	Yellow	(251,251,29)	#fbfb1d
P4-056	39.542408	-104.901085	78%	B	Light Green	(167,227,50)	#a7e332
P4-057	39.542492	-104.901123	74%	C	Yellow	(251,251,29)	#fbfb1d
P4-058	39.54253	-104.901146	86%	A	Dark Green	(85,157,91)	#559d5b
P4-059	39.542606	-104.901184	75%	C	Yellow	(251,251,29)	#fbfb1d
P4-060	39.542633	-104.901207	80%	B	Light Green	(167,227,50)	#a7e332
P4-061	39.542686	-104.901215	88%	A	Dark Green	(85,157,91)	#559d5b
P4-062	39.542744	-104.901253	85%	A	Dark Green	(85,157,91)	#559d5b
P4-063	39.542789	-104.901314	90%	A	Dark Green	(85,157,91)	#559d5b
P4-064	39.542847	-104.901314	70%	C	Yellow	(251,251,29)	#fbfb1d
P4-065	39.542908	-104.901306	58%	F	Red	(218,40,40)	#da2828
P4-066	39.542942	-104.901382	89%	A	Dark Green	(85,157,91)	#559d5b
P4-067	39.54298	-104.90136	72%	C	Yellow	(251,251,29)	#fbfb1d
P4-068	39.543053	-104.901367	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-069	39.543114	-104.901413	59%	D	Orange	(255,195,51)	#ffc333
P4-070	39.543167	-104.901405	58%	F	Red	(218,40,40)	#da2828
P4-071	39.543201	-104.901428	68%	C	Yellow	(251,251,29)	#fbfb1d
P4-072	39.54327	-104.901421	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-073	39.543308	-104.901451	67%	C	Yellow	(251,251,29)	#fbfb1d
P4-074	39.5434	-104.901512	69%	C	Yellow	(251,251,29)	#fbfb1d
P4-075	39.543434	-104.901543	65%	D	Orange	(255,195,51)	#ffc333
P4-076	39.543476	-104.901558	59%	D	Orange	(255,195,51)	#ffc333
P4-077	39.543514	-104.90155	37%	F	Red	(218,40,40)	#da2828
P4-078	39.543545	-104.901566	56%	F	Red	(218,40,40)	#da2828
P4-079	39.543636	-104.901611	81%	B	Light Green	(167,227,50)	#a7e332
P4-080	39.54369	-104.901604	64%	D	Orange	(255,195,51)	#ffc333
P4-081	39.543747	-104.901642	59%	D	Orange	(255,195,51)	#ffc333
P4-082	39.543777	-104.901672	67%	D	Orange	(255,195,51)	#ffc333
P4-083	39.543858	-104.901756	91%	A	Dark Green	(85,157,91)	#559d5b
P4-084	39.54385	-104.901863	88%	A	Dark Green	(85,157,91)	#559d5b
P4-085	39.543839	-104.901917	86%	A	Dark Green	(85,157,91)	#559d5b
P4-086	39.543827	-104.901985	63%	D	Orange	(255,195,51)	#ffc333
P4-087	39.543835	-104.902061	51%	F	Red	(218,40,40)	#da2828
P4-088	39.5438	-104.902206	69%	C	Yellow	(251,251,29)	#fbfb1d
P4-089	39.543869	-104.90213	71%	C	Yellow	(251,251,29)	#fbfb1d
P4-090	39.543865	-104.902077	50%	F	Red	(218,40,40)	#da2828

P4-091	39.543877	-104.902061	56%	F	Red	(218,40,40)	#da2828
P4-092	39.543919	-104.902031	58%	F	Red	(218,40,40)	#da2828
P4-093	39.543961	-104.901932	41%	F	Red	(218,40,40)	#da2828
P4-094	39.543999	-104.901917	53%	F	Red	(218,40,40)	#da2828
P4-095	39.544071	-104.901909	86%	A	Dark Green	(85,157,91)	#559d5b
P4-096	39.544102	-104.90184	61%	D	Orange	(255,195,51)	#ffc333
P4-097	39.544117	-104.901825	72%	C	Yellow	(251,251,29)	#fbfb1d
P4-098	39.544228	-104.901878	68%	C	Yellow	(251,251,29)	#fbfb1d
P4-099	39.544254	-104.901886	43%	F	Red	(218,40,40)	#da2828
P4-100	39.544312	-104.901825	39%	F	Red	(218,40,40)	#da2828
P4-101	39.544373	-104.901871	74%	C	Yellow	(251,251,29)	#fbfb1d
P4-102	39.544437	-104.901855	63%	D	Orange	(255,195,51)	#ffc333
P4-103	39.544472	-104.901894	60%	D	Orange	(255,195,51)	#ffc333
P4-104	39.544479	-104.901855	60%	D	Orange	(255,195,51)	#ffc333
P4-105	39.544514	-104.90184	84%	B	Light Green	(167,227,50)	#a7e332
P4-106	39.544529	-104.901787	60%	D	Orange	(255,195,51)	#ffc333
P4-107	39.544594	-104.901726	77%	B	Light Green	(167,227,50)	#a7e332
P4-108	39.544617	-104.901711	77%	B	Light Green	(167,227,50)	#a7e332
P4-109	39.544632	-104.901611	87%	A	Dark Green	(85,157,91)	#559d5b
P4-110	39.54464	-104.901596	88%	A	Dark Green	(85,157,91)	#559d5b
P4-111	39.544712	-104.901505	79%	B	Light Green	(167,227,50)	#a7e332
P4-112	39.544765	-104.901459	63%	D	Orange	(255,195,51)	#ffc333
P4-113	39.544781	-104.901482	84%	B	Light Green	(167,227,50)	#a7e332
P4-114	39.544834	-104.901436	79%	B	Light Green	(167,227,50)	#a7e332
P4-115	39.544865	-104.901428	66%	D	Orange	(255,195,51)	#ffc333
P4-116	39.544952	-104.901405	61%	D	Orange	(255,195,51)	#ffc333
P4-117	39.544956	-104.901329	82%	B	Light Green	(167,227,50)	#a7e332
P4-118	39.544945	-104.90123	86%	A	Dark Green	(85,157,91)	#559d5b
P4-119	39.545021	-104.901215	86%	A	Dark Green	(85,157,91)	#559d5b
P4-120	39.545055	-104.901169	80%	B	Light Green	(167,227,50)	#a7e332
P4-121	39.545135	-104.901192	86%	A	Dark Green	(85,157,91)	#559d5b
P4-122	39.545174	-104.901115	86%	A	Dark Green	(85,157,91)	#559d5b
P4-123	39.545235	-104.901108	66%	D	Orange	(255,195,51)	#ffc333
P4-124	39.545277	-104.9011	54%	F	Red	(218,40,40)	#da2828
P4-125	39.545338	-104.901115	68%	C	Yellow	(251,251,29)	#fbfb1d
P4-126	39.54538	-104.901085	56%	F	Red	(218,40,40)	#da2828
P4-127	39.545437	-104.901047	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-128	39.545506	-104.901054	67%	C	Yellow	(251,251,29)	#fbfb1d
P4-129	39.545544	-104.901062	64%	D	Orange	(255,195,51)	#ffc333
P4-130	39.545643	-104.900909	76%	B	Light Green	(167,227,50)	#a7e332
P4-131	39.5457	-104.901054	63%	D	Orange	(255,195,51)	#ffc333
P4-132	39.545731	-104.9011	87%	A	Dark Green	(85,157,91)	#559d5b
P4-133	39.545746	-104.901146	79%	B	Light Green	(167,227,50)	#a7e332
P4-134	39.54578	-104.901215	74%	C	Yellow	(251,251,29)	#fbfb1d
P4-135	39.545803	-104.901299	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-136	39.545971	-104.900887	90%	A	Dark Green	(85,157,91)	#559d5b
P4-137	39.545921	-104.900909	79%	B	Light Green	(167,227,50)	#a7e332
P4-138	39.545887	-104.900917	66%	D	Orange	(255,195,51)	#ffc333
P4-139	39.545837	-104.900879	78%	B	Light Green	(167,227,50)	#a7e332
P4-140	39.545807	-104.900871	74%	C	Yellow	(251,251,29)	#fbfb1d
P4-141	39.545767	-104.9008445	70%	C	Yellow	(251,251,29)	#fbfb1d
P4-142	39.545727	-104.900818	89%	A	Dark Green	(85,157,91)	#559d5b
P4-143	39.545666	-104.900772	41%	F	Red	(218,40,40)	#da2828
P4-144	39.546764	-104.899902	43%	F	Red	(218,40,40)	#da2828
P4-145	39.545574	-104.900749	51%	F	Red	(218,40,40)	#da2828
P4-146	39.545525	-104.900772	58%	F	Red	(218,40,40)	#da2828
P4-147	39.54546	-104.900711	39%	F	Red	(218,40,40)	#da2828
P4-148	39.54541	-104.900719	39%	F	Red	(218,40,40)	#da2828
P4-149	39.545376	-104.900688	66%	D	Orange	(255,195,51)	#ffc333

P4-150	39.545303	-104.900734	68%	C	Yellow	(251,251,29)	#fbfb1d
P4-151	39.545254	-104.900726	62%	D	Orange	(255,195,51)	#ffc333
P4-152	39.5452	-104.900719	76%	B	Light Green	(167,227,50)	#a7e332
P4-153	39.545162	-104.90081	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-154	39.54512	-104.900764	38%	F	Red	(218,40,40)	#da2828
P4-155	39.545048	-104.90081	65%	D	Orange	(255,195,51)	#ffc333
P4-156	39.545013	-104.900841	65%	D	Orange	(255,195,51)	#ffc333
P4-157	39.544987	-104.900879	75%	C	Yellow	(251,251,29)	#fbfb1d
P4-158	39.54493	-104.900925	98%	A	Dark Green	(85,157,91)	#559d5b
P4-159	39.544884	-104.90097	80%	B	Light Green	(167,227,50)	#a7e332
P4-160	39.544811	-104.901009	77%	B	Light Green	(167,227,50)	#a7e332
P4-161	39.5448	-104.900955	79%	B	Light Green	(167,227,50)	#a7e332
P4-162	39.544754	-104.900978	89%	A	Dark Green	(85,157,91)	#559d5b
P4-163	39.544769	-104.900963	76%	B	Light Green	(167,227,50)	#a7e332
P4-164	39.544651	-104.90107	84%	B	Light Green	(167,227,50)	#a7e332
P4-165	39.544704	-104.901161	80%	B	Light Green	(167,227,50)	#a7e332
P4-166	39.54464	-104.901108	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-167	39.544647	-104.901138	52%	F	Red	(218,40,40)	#da2828
P4-168	39.54464	-104.901222	63%	D	Orange	(255,195,51)	#ffc333
P4-169	39.544594	-104.901306	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-170	39.544575	-104.901329	59%	F	Red	(218,40,40)	#da2828
P4-171	39.544563	-104.901375	86%	A	Dark Green	(85,157,91)	#559d5b
P4-172	39.544529	-104.901413	34%	F	Red	(218,40,40)	#da2828
P4-173	39.544495	-104.901428	67%	C	Yellow	(251,251,29)	#fbfb1d
P4-174	39.544445	-104.90152	63%	D	Orange	(255,195,51)	#ffc333
P4-175	39.544388	-104.90155	44%	F	Red	(218,40,40)	#da2828
P4-176	39.544369	-104.901535	91%	A	Dark Green	(85,157,91)	#559d5b
P4-177	39.544338	-104.901573	63%	D	Orange	(255,195,51)	#ffc333
P4-178	39.544254	-104.901604	54%	F	Red	(218,40,40)	#da2828
P4-179	39.54422	-104.901596	84%	B	Light Green	(167,227,50)	#a7e332
P4-180	39.544159	-104.901611	61%	D	Orange	(255,195,51)	#ffc333
P4-181	39.544086	-104.901627	48%	F	Red	(218,40,40)	#da2828
P4-182	39.544018	-104.901619	66%	D	Orange	(255,195,51)	#ffc333
P4-183	39.543987	-104.901588	86%	A	Dark Green	(85,157,91)	#559d5b
P4-184	39.543968	-104.901588	60%	D	Orange	(255,195,51)	#ffc333
P4-185	39.543888	-104.901581	52%	F	Red	(218,40,40)	#da2828
P4-186	39.543839	-104.901566	50%	F	Red	(218,40,40)	#da2828
P4-187	39.543766	-104.901535	63%	D	Orange	(255,195,51)	#ffc333
P4-188	39.543713	-104.901497	72%	C	Yellow	(251,251,29)	#fbfb1d
P4-189	39.543633	-104.901451	66%	D	Orange	(255,195,51)	#ffc333
P4-190	39.543598	-104.901459	86%	A	Dark Green	(85,157,91)	#559d5b
P4-191	39.543564	-104.901451	71%	C	Yellow	(251,251,29)	#fbfb1d
P4-192	39.543514	-104.901398	66%	D	Orange	(255,195,51)	#ffc333
P4-193	39.543465	-104.901398	49%	F	Red	(218,40,40)	#da2828
P4-194	39.543404	-104.901352	80%	B	Light Green	(167,227,50)	#a7e332
P4-195	39.543343	-104.901321	63%	D	Orange	(255,195,51)	#ffc333
P4-196	39.543308	-104.901329	49%	F	Red	(218,40,40)	#da2828
P4-197	39.543251	-104.901291	57%	F	Red	(218,40,40)	#da2828
P4-198	39.543182	-104.901276	48%	F	Red	(218,40,40)	#da2828
P4-199	39.54314	-104.901283	61%	D	Orange	(255,195,51)	#ffc333
P4-200	39.54311	-104.901222	87%	A	Dark Green	(85,157,91)	#559d5b
P4-201	39.543053	-104.901222	78%	B	Light Green	(167,227,50)	#a7e332
P4-202	39.542984	-104.901176	47%	F	Red	(218,40,40)	#da2828
P4-203	39.542942	-104.901169	68%	C	Yellow	(251,251,29)	#fbfb1d
P4-204	39.542889	-104.901146	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-205	39.54285	-104.9011	78%	B	Light Green	(167,227,50)	#a7e332
P4-206	39.542812	-104.901146	94%	A	Dark Green	(85,157,91)	#559d5b
P4-207	39.542759	-104.901108	89%	A	Dark Green	(85,157,91)	#559d5b
P4-208	39.542698	-104.901062	67%	C	Yellow	(251,251,29)	#fbfb1d

P4-209	39.542648	-104.901016	84%	B	Light Green	(167,227,50)	#a7e332
P4-210	39.542576	-104.901031	63%	D	Orange	(255,195,51)	#ffc333
P4-211	39.542549	-104.900986	43%	F	Red	(218,40,40)	#da2828
P4-212	39.542488	-104.900978	60%	D	Orange	(255,195,51)	#ffc333
P4-213	39.542458	-104.900955	63%	D	Orange	(255,195,51)	#ffc333
P4-214	39.542389	-104.900925	74%	C	Yellow	(251,251,29)	#fbfb1d
P4-215	39.542336	-104.900894	94%	A	Dark Green	(85,157,91)	#559d5b
P4-216	39.542297	-104.900887	82%	B	Light Green	(167,227,50)	#a7e332
P4-217	39.542202	-104.900879	69%	C	Yellow	(251,251,29)	#fbfb1d
P4-218	39.542179	-104.900856	71%	C	Yellow	(251,251,29)	#fbfb1d
P4-219	39.542114	-104.900894	68%	C	Yellow	(251,251,29)	#fbfb1d
P4-220	39.542068	-104.900848	50%	F	Red	(218,40,40)	#da2828
P4-221	39.542004	-104.900841	56%	F	Red	(218,40,40)	#da2828
P4-222	39.541973	-104.900833	45%	F	Red	(218,40,40)	#da2828
P4-223	39.541908	-104.900826	58%	F	Red	(218,40,40)	#da2828
P4-224	39.541859	-104.900818	69%	C	Yellow	(251,251,29)	#fbfb1d
P4-225	39.541817	-104.900803	74%	C	Yellow	(251,251,29)	#fbfb1d
P4-226	39.541733	-104.900826	73%	C	Yellow	(251,251,29)	#fbfb1d
P4-227	39.541706	-104.90081	79%	B	Light Green	(167,227,50)	#a7e332
P4-228	39.541634	-104.90081	85%	A	Dark Green	(85,157,91)	#559d5b
P4-229	39.54158	-104.900826	90%	A	Dark Green	(85,157,91)	#559d5b
P4-230	39.541534	-104.900841	80%	B	Light Green	(167,227,50)	#a7e332
P4-231	39.541466	-104.900818	75%	C	Yellow	(251,251,29)	#fbfb1d
P4-232	39.541431	-104.900879	50%	F	Red	(218,40,40)	#da2828
P4-233	39.541359	-104.900856	75%	C	Yellow	(251,251,29)	#fbfb1d
P4-234	39.541306	-104.900902	66%	D	Orange	(255,195,51)	#ffc333
P4-235	39.541248	-104.900887	77%	B	Light Green	(167,227,50)	#a7e332
P4-236	39.541168	-104.900826	66%	D	Orange	(255,195,51)	#ffc333
P4-237	39.541153	-104.900879	54%	F	Red	(218,40,40)	#da2828
P4-238	39.541088	-104.900856	90%	A	Dark Green	(85,157,91)	#559d5b
P4-239	39.540997	-104.900795	67%	C	Yellow	(251,251,29)	#fbfb1d
P4-240	39.541004	-104.90081	88%	A	Dark Green	(85,157,91)	#559d5b
P4-241	39.541031	-104.900772	90%	A	Dark Green	(85,157,91)	#559d5b
P4-242	39.541004	-104.900764	88%	A	Dark Green	(85,157,91)	#559d5b
P4-243	39.540924	-104.900742	88%	A	Dark Green	(85,157,91)	#559d5b
P4-244	39.540874	-104.900726	91%	A	Dark Green	(85,157,91)	#559d5b
P4-245	39.540886	-104.900635	87%	A	Dark Green	(85,157,91)	#559d5b
P4-246	39.540867	-104.90062	88%	A	Dark Green	(85,157,91)	#559d5b
P4-247	39.540745	-104.900558	88%	A	Dark Green	(85,157,91)	#559d5b
P4-248	39.540771	-104.900528	84%	B	Light Green	(167,227,50)	#a7e332
P4-249	39.540676	-104.900589	98%	A	Dark Green	(85,157,91)	#559d5b
P4-250	39.540615	-104.900658	98%	A	Dark Green	(85,157,91)	#559d5b
P4-251	39.540554	-104.900719	88%	A	Dark Green	(85,157,91)	#559d5b
P4-252	39.540596	-104.900513	79%	B	Light Green	(167,227,50)	#a7e332
P4-253	39.540512	-104.900566	87%	A	Dark Green	(85,157,91)	#559d5b
P4-254	39.540554	-104.900459	92%	A	Dark Green	(85,157,91)	#559d5b
P4-255	39.540333	-104.900749	86%	A	Dark Green	(85,157,91)	#559d5b
P4-256	39.540337	-104.90049	82%	B	Light Green	(167,227,50)	#a7e332
P4-257	39.540375	-104.900414	84%	B	Light Green	(167,227,50)	#a7e332
P4-258	39.540337	-104.900345	83%	B	Light Green	(167,227,50)	#a7e332
P4-259	39.540333	-104.900284	86%	A	Dark Green	(85,157,91)	#559d5b
P4-260	39.540279	-104.900299	72%	C	Yellow	(251,251,29)	#fbfb1d
P4-261	39.540241	-104.900215	93%	A	Dark Green	(85,157,91)	#559d5b
P4-262	39.540207	-104.900131	89%	A	Dark Green	(85,157,91)	#559d5b
P4-263	39.540237	-104.900085	71%	C	Yellow	(251,251,29)	#fbfb1d
P4-264	39.540215	-104.90004	65%	D	Orange	(255,195,51)	#ffc333
P5-001	39.534904	-104.89949	68%	C	Yellow	(251,251,29)	#fbfb1d
P5-002	39.535259	-104.901619	52%	F	Red	(218,40,40)	#da2828
P5-003	39.535206	-104.901733	57%	F	Red	(218,40,40)	#da2828

P5-004	39.535141	-104.901665	74%	C	Yellow	(251,251,29)	#fbfb1d
P5-005	39.535084	-104.901642	61%	D	Orange	(255,195,51)	#ffc333
P5-006	39.535061	-104.901619	66%	D	Orange	(255,195,51)	#ffc333
P5-007	39.535023	-104.901543	90%	A	Dark Green	(85,157,91)	#559d5b
P5-008	39.534992	-104.901505	65%	D	Orange	(255,195,51)	#ffc333
P5-009	39.534962	-104.901459	64%	D	Orange	(255,195,51)	#ffc333
P5-010	39.534935	-104.901405	72%	C	Yellow	(251,251,29)	#fbfb1d
P5-011	39.534878	-104.901367	65%	D	Orange	(255,195,51)	#ffc333
P5-012	39.53484	-104.901329	70%	C	Yellow	(251,251,29)	#fbfb1d
P5-013	39.534813	-104.901268	75%	C	Yellow	(251,251,29)	#fbfb1d
P5-014	39.534786	-104.90123	73%	C	Yellow	(251,251,29)	#fbfb1d
P5-015	39.534744	-104.901154	61%	D	Orange	(255,195,51)	#ffc333
P5-016	39.534744	-104.901093	66%	D	Orange	(255,195,51)	#ffc333
P5-017	39.534721	-104.901062	81%	B	Light Green	(167,227,50)	#a7e332
P5-018	39.534512	-104.898659	63%	D	Orange	(255,195,51)	#ffc333
P5-019	39.534485	-104.898613	61%	D	Orange	(255,195,51)	#ffc333
P5-020	39.534515	-104.898499	61%	D	Orange	(255,195,51)	#ffc333
P5-021	39.534512	-104.898438	75%	C	Yellow	(251,251,29)	#fbfb1d
P5-022	39.534595	-104.897987	75%	C	Yellow	(251,251,29)	#fbfb1d
P5-023	39.534611	-104.897995	68%	C	Yellow	(251,251,29)	#fbfb1d
P5-024	39.534634	-104.897934	51%	F	Red	(218,40,40)	#da2828
P5-025	39.53463	-104.897865	60%	D	Orange	(255,195,51)	#ffc333
P5-026	39.534576	-104.897713	64%	D	Orange	(255,195,51)	#ffc333
P5-027	39.534676	-104.897743	66%	D	Orange	(255,195,51)	#ffc333
P5-028	39.53471	-104.89769	64%	D	Orange	(255,195,51)	#ffc333
P5-029	39.534752	-104.897591	67%	C	Yellow	(251,251,29)	#fbfb1d
P5-030	39.534798	-104.89756	83%	B	Light Green	(167,227,50)	#a7e332
P5-031	39.53484	-104.897522	75%	C	Yellow	(251,251,29)	#fbfb1d
P5-032	39.534878	-104.897476	63%	D	Orange	(255,195,51)	#ffc333
P5-033	39.534946	-104.897408	62%	D	Orange	(255,195,51)	#ffc333
P5-034	39.535358	-104.896782	95%	A	Dark Green	(85,157,91)	#559d5b
P5-035	39.535324	-104.896797	87%	A	Dark Green	(85,157,91)	#559d5b
P5-036	39.535267	-104.896805	80%	B	Light Green	(167,227,50)	#a7e332
P5-037	39.535236	-104.896858	96%	A	Dark Green	(85,157,91)	#559d5b
P5-038	39.535149	-104.896858	63%	D	Orange	(255,195,51)	#ffc333
P5-039	39.534931	-104.897003	96%	A	Dark Green	(85,157,91)	#559d5b
P5-040	39.534843	-104.897018	93%	A	Dark Green	(85,157,91)	#559d5b
P5-041	39.534859	-104.897072	78%	B	Light Green	(167,227,50)	#a7e332
P5-042	39.534752	-104.897057	89%	A	Dark Green	(85,157,91)	#559d5b
P5-043	39.534725	-104.897072	90%	A	Dark Green	(85,157,91)	#559d5b
P5-044	39.534424	-104.897453	79%	B	Light Green	(167,227,50)	#a7e332
P5-045	39.534428	-104.897552	71%	C	Yellow	(251,251,29)	#fbfb1d
P5-046	39.534431	-104.897591	60%	D	Orange	(255,195,51)	#ffc333
P5-047	39.534397	-104.897659	63%	D	Orange	(255,195,51)	#ffc333
P5-048	39.534363	-104.89772	73%	C	Yellow	(251,251,29)	#fbfb1d
P5-049	39.534363	-104.897774	74%	C	Yellow	(251,251,29)	#fbfb1d
P5-050	39.534294	-104.897835	77%	B	Light Green	(167,227,50)	#a7e332
P5-051	39.534248	-104.89782	69%	C	Yellow	(251,251,29)	#fbfb1d
P5-052	39.534191	-104.89785	64%	D	Orange	(255,195,51)	#ffc333
P5-053	39.534138	-104.897842	65%	D	Orange	(255,195,51)	#ffc333
P5-054	39.533936	-104.898102	69%	C	Yellow	(251,251,29)	#fbfb1d
P5-055	39.533863	-104.898125	63%	D	Orange	(255,195,51)	#ffc333
P5-056	39.533775	-104.898132	62%	D	Orange	(255,195,51)	#ffc333
P5-057	39.533749	-104.898109	64%	D	Orange	(255,195,51)	#ffc333
P5-058	39.533684	-104.898109	72%	C	Yellow	(251,251,29)	#fbfb1d
P5-059	39.533634	-104.898109	73%	C	Yellow	(251,251,29)	#fbfb1d
P5-060	39.5336	-104.898125	90%	A	Dark Green	(85,157,91)	#559d5b
P5-061	39.53352	-104.898125	63%	D	Orange	(255,195,51)	#ffc333
P5-062	39.533482	-104.898117	88%	A	Dark Green	(85,157,91)	#559d5b

P5-063	39.533405	-104.898117	80%	B	Light Green	(167,227,50)	#a7e332
P5-064	39.53336	-104.898178	79%	B	Light Green	(167,227,50)	#a7e332
P5-065	39.53331	-104.898132	78%	B	Light Green	(167,227,50)	#a7e332
P5-066	39.532963	-104.898186	89%	A	Dark Green	(85,157,91)	#559d5b
P5-067	39.532917	-104.89817	69%	C	Yellow	(251,251,29)	#fbfb1d
P5-068	39.532845	-104.898201	78%	B	Light Green	(167,227,50)	#a7e332
P5-069	39.532799	-104.898193	75%	C	Yellow	(251,251,29)	#fbfb1d
P5-070	39.532619	-104.898071	85%	A	Dark Green	(85,157,91)	#559d5b
P5-071	39.532581	-104.898056	60%	D	Orange	(255,195,51)	#ffc333
P5-072	39.532539	-104.898087	55%	F	Red	(218,40,40)	#da2828
P5-073	39.532501	-104.898079	86%	A	Dark Green	(85,157,91)	#559d5b
P5-074	39.532433	-104.898132	78%	B	Light Green	(167,227,50)	#a7e332
P5-075	39.532364	-104.898109	87%	A	Dark Green	(85,157,91)	#559d5b
P5-076	39.532333	-104.898155	66%	D	Orange	(255,195,51)	#ffc333
P5-077	39.532261	-104.898163	77%	B	Light Green	(167,227,50)	#a7e332
P5-078	39.532219	-104.89814	87%	A	Dark Green	(85,157,91)	#559d5b
P5-079	39.532166	-104.898178	90%	A	Dark Green	(85,157,91)	#559d5b
P5-080	39.532124	-104.898239	91%	A	Dark Green	(85,157,91)	#559d5b
P5-081	39.532074	-104.89817	69%	C	Yellow	(251,251,29)	#fbfb1d
P5-082	39.532059	-104.89817	95%	A	Dark Green	(85,157,91)	#559d5b
P5-083	39.532036	-104.898148	81%	B	Light Green	(167,227,50)	#a7e332
P5-084	39.531982	-104.898193	79%	B	Light Green	(167,227,50)	#a7e332
P5-085	39.531967	-104.898178	85%	A	Dark Green	(85,157,91)	#559d5b
P5-086	39.531963	-104.898186	78%	B	Light Green	(167,227,50)	#a7e332
P5-087	39.53162	-104.898453	58%	F	Red	(218,40,40)	#da2828
P5-088	39.531559	-104.898445	79%	B	Light Green	(167,227,50)	#a7e332
P5-089	39.531498	-104.898445	68%	C	Yellow	(251,251,29)	#fbfb1d
P5-090	39.531452	-104.898422	79%	B	Light Green	(167,227,50)	#a7e332
P5-091	39.531414	-104.898422	90%	A	Dark Green	(85,157,91)	#559d5b
P5-092	39.531334	-104.898399	68%	C	Yellow	(251,251,29)	#fbfb1d
P5-093	39.531292	-104.898399	80%	B	Light Green	(167,227,50)	#a7e332
P5-094	39.530872	-104.898323	63%	D	Orange	(255,195,51)	#ffc333
P5-095	39.530834	-104.898308	65%	D	Orange	(255,195,51)	#ffc333
P5-096	39.530788	-104.898293	54%	F	Red	(218,40,40)	#da2828
P5-097	39.530735	-104.898293	54%	F	Red	(218,40,40)	#da2828
P5-098	39.530697	-104.898262	64%	D	Orange	(255,195,51)	#ffc333
P5-099	39.530624	-104.898262	51%	F	Red	(218,40,40)	#da2828
P5-100	39.530582	-104.898201	75%	C	Yellow	(251,251,29)	#fbfb1d
P5-101	39.530529	-104.898216	54%	F	Red	(218,40,40)	#da2828
P5-102	39.530487	-104.898193	62%	D	Orange	(255,195,51)	#ffc333
P5-103	39.530457	-104.898163	59%	D	Orange	(255,195,51)	#ffc333
P5-104	39.529949	-104.897972	65%	D	Orange	(255,195,51)	#ffc333
P5-105	39.529961	-104.897888	78%	B	Light Green	(167,227,50)	#a7e332
P5-106	39.529896	-104.897873	56%	F	Red	(218,40,40)	#da2828
P5-107	39.529884	-104.897835	60%	D	Orange	(255,195,51)	#ffc333
P5-108	39.529831	-104.89782	66%	D	Orange	(255,195,51)	#ffc333
P5-109	39.529785	-104.897812	76%	B	Light Green	(167,227,50)	#a7e332
P5-110	39.529762	-104.897781	58%	F	Red	(218,40,40)	#da2828
P5-111	39.529285	-104.897636	63%	D	Orange	(255,195,51)	#ffc333
P5-112	39.529247	-104.89769	64%	D	Orange	(255,195,51)	#ffc333
P5-113	39.529198	-104.897697	67%	D	Orange	(255,195,51)	#ffc333
P5-114	39.529144	-104.897705	73%	C	Yellow	(251,251,29)	#fbfb1d
P5-115	39.531475	-104.898506	76%	B	Light Green	(167,227,50)	#a7e332
P5-116	39.531338	-104.89859	85%	A	Dark Green	(85,157,91)	#559d5b
P5-117	39.531391	-104.898582	79%	B	Light Green	(167,227,50)	#a7e332
P5-118	39.531433	-104.898582	75%	B	Light Green	(167,227,50)	#a7e332
P5-119	39.531471	-104.898567	76%	B	Light Green	(167,227,50)	#a7e332
P5-120	39.53154	-104.898582	78%	B	Light Green	(167,227,50)	#a7e332
P5-121	39.53159	-104.89859	89%	A	Dark Green	(85,157,91)	#559d5b

P5-122	39.531631	-104.898598	88%	A	Dark Green	(85,157,91)	#559d5b
P5-123	39.531693	-104.898605	75%	B	Light Green	(167,227,50)	#a7e332
P5-124	39.532078	-104.898651	77%	B	Light Green	(167,227,50)	#a7e332
P5-125	39.53212	-104.898643	85%	A	Dark Green	(85,157,91)	#559d5b
P5-126	39.532169	-104.898636	78%	B	Light Green	(167,227,50)	#a7e332
P5-127	39.532207	-104.898659	81%	B	Light Green	(167,227,50)	#a7e332
P5-128	39.532288	-104.898621	88%	A	Dark Green	(85,157,91)	#559d5b
P5-129	39.532291	-104.898712	88%	A	Dark Green	(85,157,91)	#559d5b
P5-130	39.532322	-104.898811	85%	A	Dark Green	(85,157,91)	#559d5b
P5-131	39.532314	-104.898842	62%	D	Orange	(255,195,51)	#ffc333
P5-132	39.532284	-104.898872	69%	C	Yellow	(251,251,29)	#fbfb1d
P5-133	39.532352	-104.898834	85%	A	Dark Green	(85,157,91)	#559d5b
P5-134	39.532417	-104.898849	61%	D	Orange	(255,195,51)	#ffc333
P5-135	39.532413	-104.898842	92%	A	Dark Green	(85,157,91)	#559d5b
P5-136	39.53249	-104.898842	63%	D	Orange	(255,195,51)	#ffc333
P5-137	39.532429	-104.899094	85%	A	Dark Green	(85,157,91)	#559d5b
P5-138	39.532803	-104.898346	66%	D	Orange	(255,195,51)	#ffc333
P5-139	39.532856	-104.898354	75%	B	Light Green	(167,227,50)	#a7e332
P5-140	39.532898	-104.898323	62%	D	Orange	(255,195,51)	#ffc333
P5-141	39.532944	-104.898338	80%	B	Light Green	(167,227,50)	#a7e332
P5-142	39.533253	-104.898621	80%	B	Light Green	(167,227,50)	#a7e332
P5-143	39.533321	-104.898636	78%	B	Light Green	(167,227,50)	#a7e332
P5-144	39.533409	-104.898659	48%	F	Red	(218,40,40)	#da2828
P5-145	39.53344	-104.898651	65%	D	Orange	(255,195,51)	#ffc333
P5-146	39.533524	-104.898643	60%	D	Orange	(255,195,51)	#ffc333
P5-147	39.533546	-104.898621	63%	D	Orange	(255,195,51)	#ffc333
P5-148	39.533615	-104.898613	66%	D	Orange	(255,195,51)	#ffc333
P5-149	39.533627	-104.898537	67%	C	Yellow	(251,251,29)	#fbfb1d
P5-150	39.533684	-104.89856	65%	D	Orange	(255,195,51)	#ffc333
P5-151	39.53371	-104.898476	74%	C	Yellow	(251,251,29)	#fbfb1d
P5-152	39.533764	-104.89846	72%	C	Yellow	(251,251,29)	#fbfb1d
P5-153	39.533844	-104.898445	73%	C	Yellow	(251,251,29)	#fbfb1d
P5-154	39.533886	-104.89846	78%	B	Light Green	(167,227,50)	#a7e332
P5-155	39.53405	-104.89843	95%	A	Dark Green	(85,157,91)	#559d5b
P5-156	39.534046	-104.898445	68%	C	Yellow	(251,251,29)	#fbfb1d
P5-157	39.534126	-104.898476	69%	C	Yellow	(251,251,29)	#fbfb1d
P5-158	39.53418	-104.898521	83%	B	Light Green	(167,227,50)	#a7e332
P5-159	39.534267	-104.898552	64%	D	Orange	(255,195,51)	#ffc333
P5-160	39.534336	-104.898766	63%	D	Orange	(255,195,51)	#ffc333
P5-161	39.534286	-104.898682	61%	D	Orange	(255,195,51)	#ffc333
P5-162	39.53429	-104.898705	60%	D	Orange	(255,195,51)	#ffc333
P5-163	39.534374	-104.898758	57%	F	Red	(218,40,40)	#da2828
P5-164	39.534363	-104.898849	61%	D	Orange	(255,195,51)	#ffc333
P5-165	39.53434	-104.898911	84%	B	Light Green	(167,227,50)	#a7e332
P5-166	39.534401	-104.898964	81%	B	Light Green	(167,227,50)	#a7e332
P5-167	39.534481	-104.899048	59%	D	Orange	(255,195,51)	#ffc333
P5-168	39.534382	-104.899132	46%	F	Red	(218,40,40)	#da2828
P5-169	39.534374	-104.899193	84%	B	Light Green	(167,227,50)	#a7e332
P5-170	39.534363	-104.899246	82%	B	Light Green	(167,227,50)	#a7e332
P5-171	39.534279	-104.899345	59%	D	Orange	(255,195,51)	#ffc333
P5-172	39.534256	-104.899368	42%	F	Red	(218,40,40)	#da2828
P5-173	39.534252	-104.899399	86%	A	Dark Green	(85,157,91)	#559d5b
P5-174	39.534191	-104.89949	61%	D	Orange	(255,195,51)	#ffc333
P5-175	39.534164	-104.899513	83%	B	Light Green	(167,227,50)	#a7e332
P5-176	39.534126	-104.89959	64%	D	Orange	(255,195,51)	#ffc333
P5-177	39.534134	-104.899612	67%	C	Yellow	(251,251,29)	#fbfb1d
P5-178	39.534199	-104.899628	77%	B	Light Green	(167,227,50)	#a7e332
P5-179	39.534275	-104.89962	94%	A	Dark Green	(85,157,91)	#559d5b
P5-180	39.534359	-104.899612	60%	D	Orange	(255,195,51)	#ffc333

P5-181	39.534351	-104.899605	64%	D	Orange	(255,195,51)	#ffc333
P5-182	39.534431	-104.899628	57%	F	Red	(218,40,40)	#da2828
P5-183	39.534405	-104.899719	87%	A	Dark Green	(85,157,91)	#559d5b
P5-184	39.534451	-104.900284	55%	F	Red	(218,40,40)	#da2828
P5-185	39.534462	-104.900352	50%	F	Red	(218,40,40)	#da2828
P5-186	39.534447	-104.900436	65%	D	Orange	(255,195,51)	#ffc333
P5-187	39.534485	-104.900467	75%	C	Yellow	(251,251,29)	#fbfb1d
P5-188	39.534588	-104.901146	75%	B	Light Green	(167,227,50)	#a7e332
P5-189	39.534576	-104.901184	53%	F	Red	(218,40,40)	#da2828
P5-190	39.534615	-104.901215	91%	A	Dark Green	(85,157,91)	#559d5b
P5-191	39.538757	-104.891304	83%	B	Light Green	(167,227,50)	#a7e332
P5-192	39.538673	-104.891441	66%	D	Orange	(255,195,51)	#ffc333
P5-193	39.538757	-104.891396	61%	D	Orange	(255,195,51)	#ffc333
P5-194	39.538731	-104.891411	66%	D	Orange	(255,195,51)	#ffc333
P5-195	39.538799	-104.891403	66%	D	Orange	(255,195,51)	#ffc333
P5-196	39.538853	-104.891411	63%	D	Orange	(255,195,51)	#ffc333
P5-197	39.538895	-104.891396	67%	C	Yellow	(251,251,29)	#fbfb1d
P5-198	39.538956	-104.891373	71%	C	Yellow	(251,251,29)	#fbfb1d
P5-199	39.539009	-104.891411	60%	D	Orange	(255,195,51)	#ffc333
P5-200	39.539059	-104.891434	79%	B	Light Green	(167,227,50)	#a7e332
P5-201	39.539116	-104.891449	81%	B	Light Green	(167,227,50)	#a7e332
P5-202	39.539169	-104.891487	93%	A	Dark Green	(85,157,91)	#559d5b
P5-203	39.539185	-104.891548	97%	A	Dark Green	(85,157,91)	#559d5b
P5-204	39.539745	-104.891808	67%	C	Yellow	(251,251,29)	#fbfb1d
P5-205	39.539776	-104.891808	67%	C	Yellow	(251,251,29)	#fbfb1d
P5-206	39.539833	-104.891777	71%	C	Yellow	(251,251,29)	#fbfb1d
P5-207	39.539875	-104.891785	64%	D	Orange	(255,195,51)	#ffc333
P5-208	39.539902	-104.891808	78%	B	Light Green	(167,227,50)	#a7e332
P5-209	39.53997	-104.891838	95%	A	Dark Green	(85,157,91)	#559d5b
P5-210	39.540028	-104.891846	94%	A	Dark Green	(85,157,91)	#559d5b
P5-211	39.540043	-104.891838	98%	A	Dark Green	(85,157,91)	#559d5b
P5-212	39.540062	-104.891846	68%	C	Yellow	(251,251,29)	#fbfb1d
P5-213	39.540054	-104.891853	67%	C	Yellow	(251,251,29)	#fbfb1d
P5-214	39.540089	-104.891922	69%	C	Yellow	(251,251,29)	#fbfb1d
P5-215	39.54015	-104.891922	65%	D	Orange	(255,195,51)	#ffc333
P5-216	39.540218	-104.891968	79%	B	Light Green	(167,227,50)	#a7e332
P5-217	39.540253	-104.891998	97%	A	Dark Green	(85,157,91)	#559d5b
P5-218	39.54026	-104.892014	97%	A	Dark Green	(85,157,91)	#559d5b
P5-219	39.540585	-104.891846	78%	B	Light Green	(167,227,50)	#a7e332
P5-220	39.540638	-104.89193	66%	D	Orange	(255,195,51)	#ffc333
P5-221	39.540691	-104.89196	76%	B	Light Green	(167,227,50)	#a7e332
P5-222	39.540741	-104.89196	49%	F	Red	(218,40,40)	#da2828
P5-223	39.540779	-104.891914	62%	D	Orange	(255,195,51)	#ffc333
P5-224	39.540833	-104.891922	47%	F	Red	(218,40,40)	#da2828
P5-225	39.54089	-104.891914	85%	A	Dark Green	(85,157,91)	#559d5b
P5-226	39.540951	-104.891907	97%	A	Dark Green	(85,157,91)	#559d5b
P5-227	39.540966	-104.891968	98%	A	Dark Green	(85,157,91)	#559d5b
P5-228	39.541367	-104.891609	82%	B	Light Green	(167,227,50)	#a7e332
P5-229	39.541405	-104.891685	76%	B	Light Green	(167,227,50)	#a7e332
P5-230	39.541397	-104.89164	92%	A	Dark Green	(85,157,91)	#559d5b
P5-231	39.541439	-104.891602	72%	C	Yellow	(251,251,29)	#fbfb1d
P5-232	39.541451	-104.891609	91%	A	Dark Green	(85,157,91)	#559d5b
P5-233	39.541451	-104.891617	56%	F	Red	(218,40,40)	#da2828
P5-234	39.541451	-104.891525	62%	D	Orange	(255,195,51)	#ffc333
P5-235	39.541527	-104.89151	68%	C	Yellow	(251,251,29)	#fbfb1d
P5-236	39.541557	-104.891495	95%	A	Dark Green	(85,157,91)	#559d5b
P5-237	39.541569	-104.891556	97%	A	Dark Green	(85,157,91)	#559d5b
P5-238	39.541992	-104.890831	84%	B	Light Green	(167,227,50)	#a7e332
P5-239	39.542023	-104.890816	67%	D	Orange	(255,195,51)	#ffc333

P5-240	39.542	-104.890793	68%	C	Yellow	(251,251,29)	#fbfb1d
P5-241	39.541962	-104.890778	82%	B	Light Green	(167,227,50)	#a7e332
P5-242	39.541996	-104.890739	71%	C	Yellow	(251,251,29)	#fbfb1d
P5-243	39.542072	-104.890625	71%	C	Yellow	(251,251,29)	#fbfb1d
P5-244	39.542068	-104.89064	75%	C	Yellow	(251,251,29)	#fbfb1d
P5-245	39.542103	-104.890648	97%	A	Dark Green	(85,157,91)	#559d5b
P5-246	39.542118	-104.890602	97%	A	Dark Green	(85,157,91)	#559d5b

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APPENDIX B

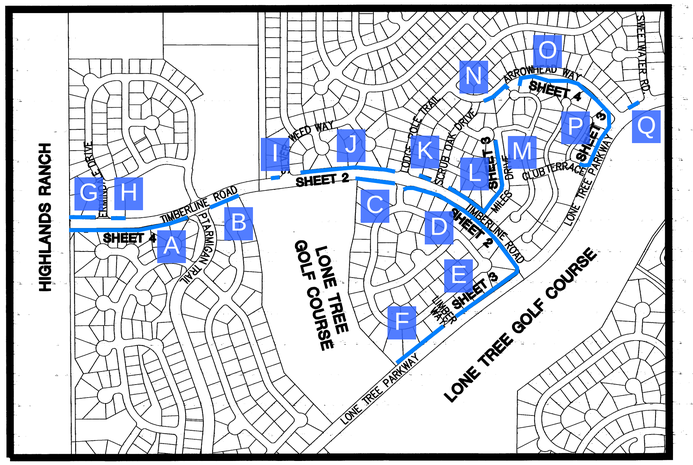
Maps of Locations for Each Panel

Organized by Phase

2003 FENCE PROGRAM
LONE TREE

PLAN SET NO.

CONSTRUCTION PLANS
FOR
THE CITY OF LONE TREE 2003 FENCE PROGRAM
CITY OF LONE TREE, COLORADO (PHASE ONE)
MAY 2003



VICINITY MAP
SCALE: 1"=500'

SHEET INDEX

TST
TST INC. of DENVER
Consulting Engineers

GENERAL NOTES

1. All materials and workmanship shall be subject to inspection by the City of Lone Tree Engineering Division. The City reserves the right to accept or reject any such materials and workmanship that does not conform to its Standards and Specifications.

2. The Contractor shall notify the City of Lone Tree Engineering Division Inspection Section, (303) 662-8112, a minimum of 48 hours and a maximum of 96 hours prior to starting construction.

3. Locations of the existing utilities shown have been determined from the best available information. Location of existing utilities shall be verified by the Contractor prior to actual construction. For information, contact: UNCC at (800) 922-1987.

4. The Contractor shall have one (1) signed copy of the plans at the job site at all times.

5. A plan for traffic control during construction shall be submitted to the City of Lone Tree Engineer for acceptance with the permit application.

6. The Contractor is responsible for the timely notification of all the appropriate agencies prior to construction.

7. All existing structures including fences, signs, and improvements destroyed, damaged or removed due to the construction of the project shall be replaced or restored in like and kind at the Contractor's expense, unless otherwise indicated on drawings or included in the contract as refurbished landscaping.

8. The Contractor shall coordinate with the City and affected Residents as to the construction schedule and notification to all affected parties. At least fourteen (14) days prior to removal of the existing wood fence, Contractor shall place a notice on each home's front door indicating that Contractor expects to be removing the fence on an estimated dte. This notice shall include a phone number for the resident to schedule a time to meet with Contractor's representative. This phone number shall be answered by a representative of Contractor during the hours of 8:00 a.m. to 5:00 p.m., Monday through Friday and provide the option to leave a message during other hours. The Contractor and a City representative will attempt to meet with effected homeowner approximately one week prior to removal of that homeowner's fence to determine what needs to be removed or relocated in the yards.

9. The Contractor shall be responsible for all back filling after form removal.

10. The Contractor shall be responsible for obtaining a disposal site for all material removed from the project.

11. Contractor shall limit encroachment in the yards of homeowners to eighteen (18) inches unless expressly approved by City representative.

12. Contractor shall make best efforts to avoid damage to landscaping, sprinkler systems and other existing improvements.

13. Contractor shall install plastic construction fence across the back yard immediately after the fence has been removed. Fence shall be maintained until the brick fence is complete on that lot and shall then be promptly removed by Contractor.

14. No more than seven (7) days may elapse between removal of existing fence on any lot and completion of the new brick fence.

15. Landscape repairs shall be completed on each lot within five days of completion of the brick fence on said lot.

16. Final proposed brick fence alignment to be determined by Owner's Representative in the field.

17. All landscaping located on the Right-of-Way side of the fence adjacent to Lone Tree Parkway is subject to removal at the discretion of the Contractor and Owner's Representative.

18. All existing brick columns and caissons within alignment of proposed fence shall be removed. Existing caissons shall be removed to a depth of at least 18 inches below grade.

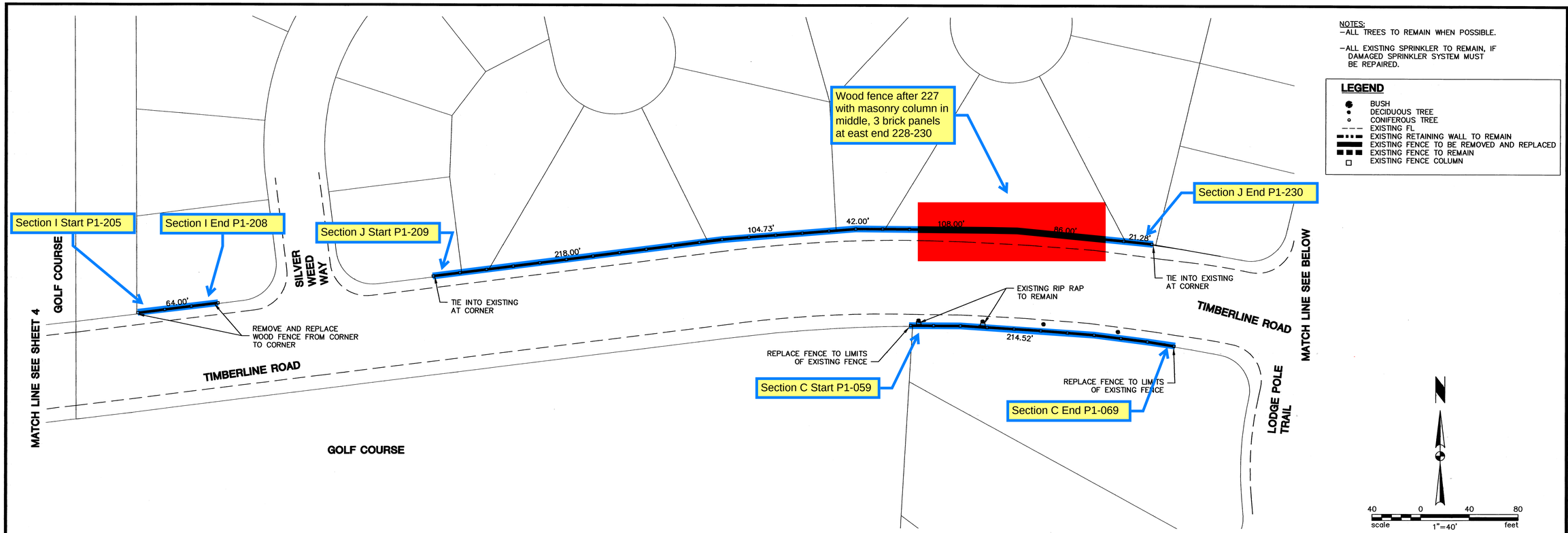
19. Contractor is responsible for removal and disposal, off site, of all excess soil from caisson drilling, removed fence material, removed brick, removed vegetation and any other excess materials and debris.

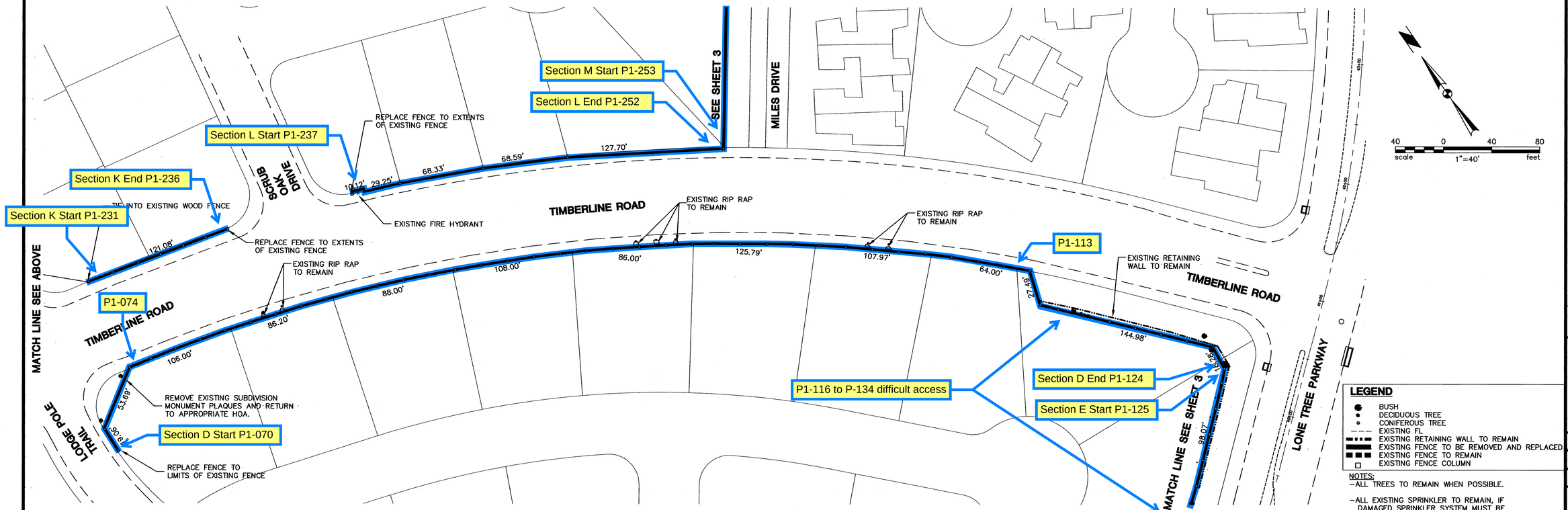
Dig Safely.
1.800.922.1987
www.uncc.org

CERTIFIED CONSULTING ENGINEER 255 COLORADO

JOHN P. COTTEN

COLORADO REGISTERED JOHN P. COTTEN 18007 PROFESSIONAL ENGINEER





REVISIONS

Description	Date	By

DESIGNED CJC
CHECKED
VIEW CJC
FILE ROAD5

COLORADO REGISTERED JOHN P. COTTEN 5-13-03 18007 PROFESSIONAL ENGINEER

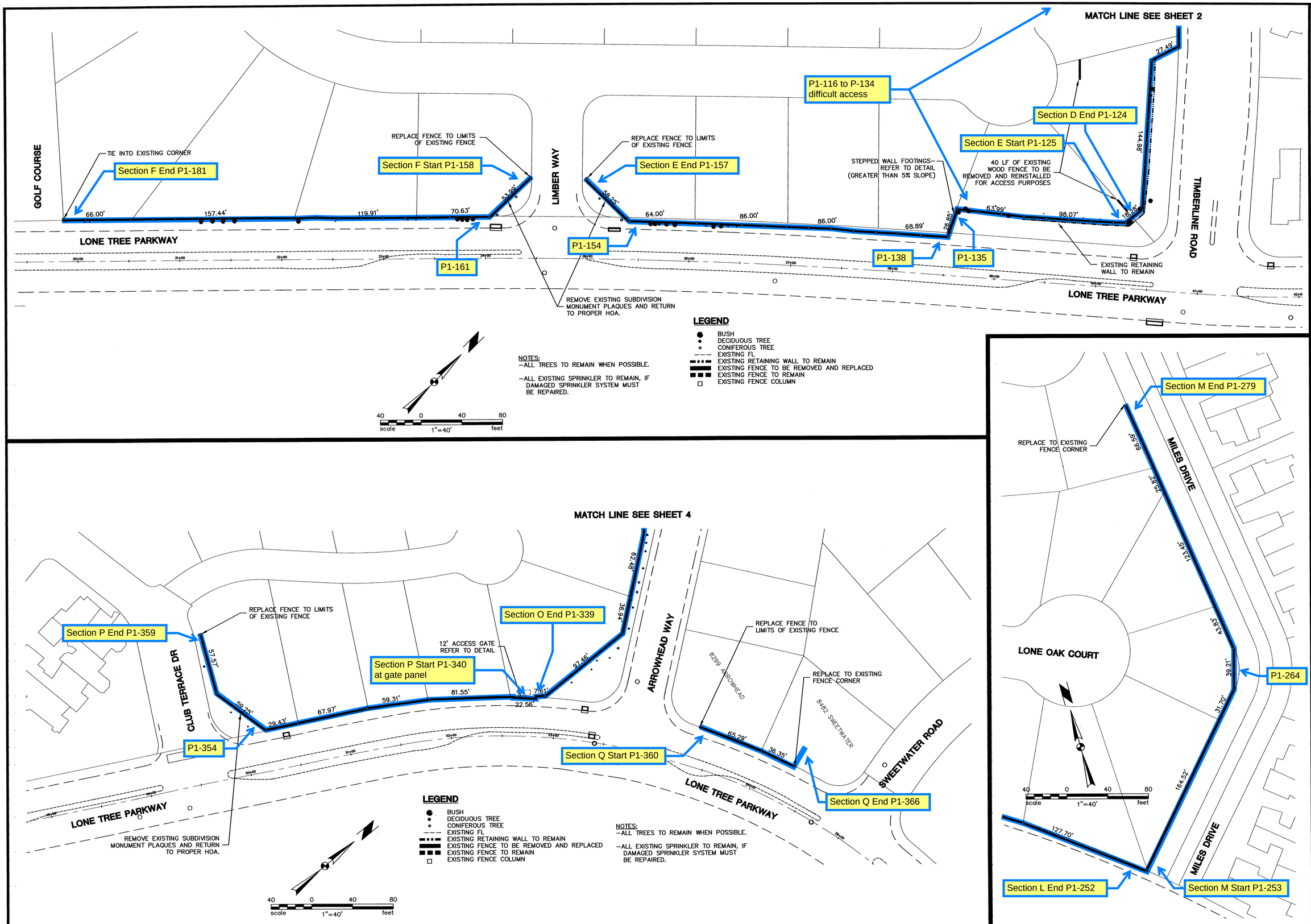
CERTIFIED CONSULTING 255 COLORADO ENGINEER
JOHN P. COTTEN

CITY OF LONE TREE 2003 FENCE PROGRAM

TIMBERLINE ROAD

TST
TST INC. OF DENVER
Consulting Engineers

JOB NO.	SCALE	DATE	SHEETS	SHEET
061-101	1"=40'	MAY 2003	7	2



REVISIONS

Description	Date	By

DESIGNED CJC
CHECKED
VIEW CJC
FILE ROAD5

COLORADO REGISTERED JOHN P. COTTEN 5-13-13 18007 PROFESSIONAL ENGINEER

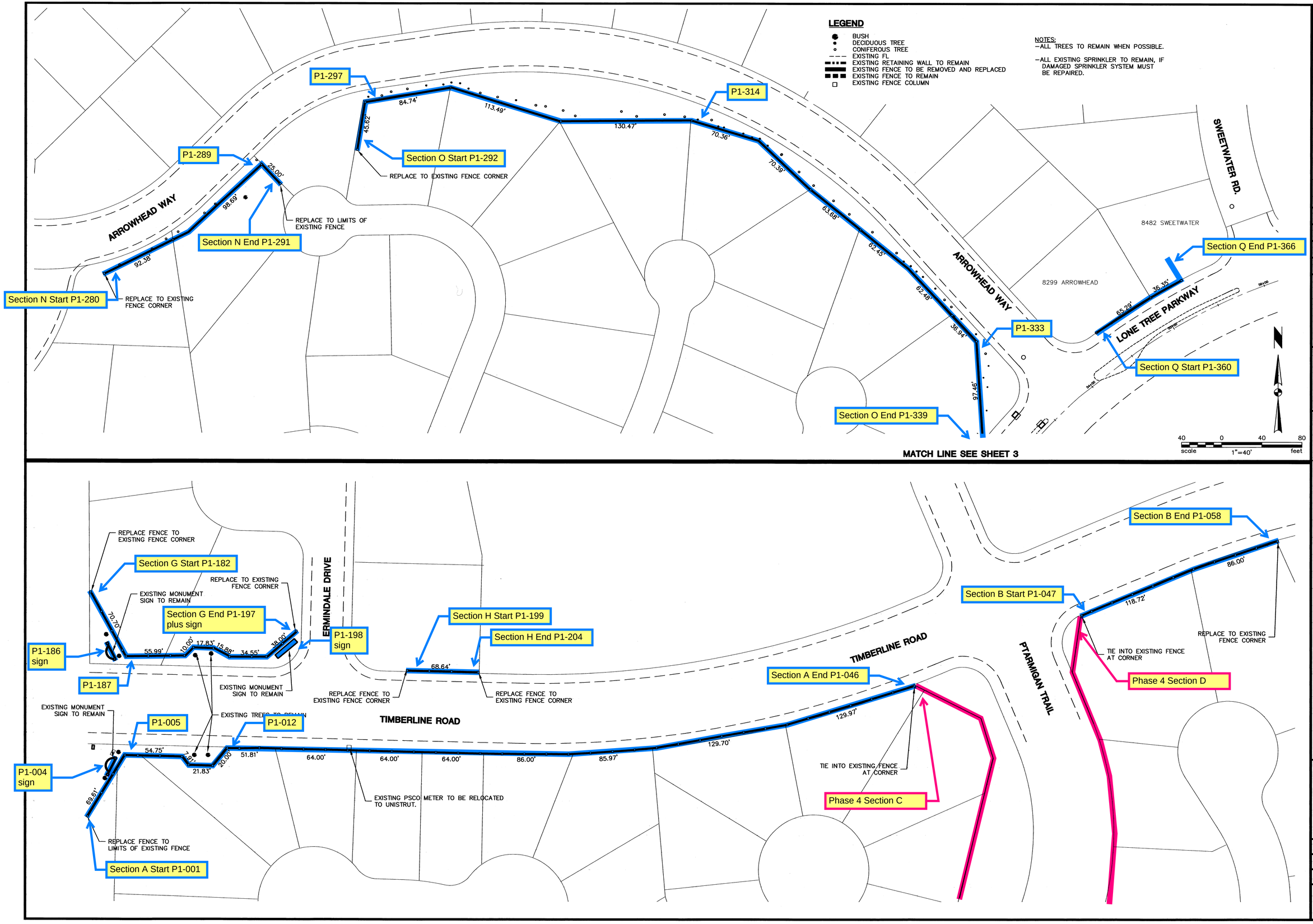
CERTIFIED CONSULTING 255 COLORADO ENGINEER
JOHN P. COTTEN

CITY OF LONE TREE 2003 FENCE PROGRAM

LONE TREE PARKWAY/ MILES DRIVE

TST
TST INC. OF DENVER
Consulting Engineers

JOB NO.	061-101
SCALE	1"=40'
DATE	MAY 2003
SHEETS	7
SHEET	3



REVISIONS

Description	Date	By

DESIGNED CJC
CHECKED
VIEW CJC
FILE ROAD5

COLORADO REGISTERED JOHN P. COTTEN 5-13-04 18007 PROFESSIONAL ENGINEER

CERTIFIED CONSULTING ENGINEER 255 COLORADO

JOHN P. COTTEN

CITY OF LONE TREE
2003 FENCE PROGRAM
ARROWHEAD WAY/ TIMBERLINE ROAD

TST

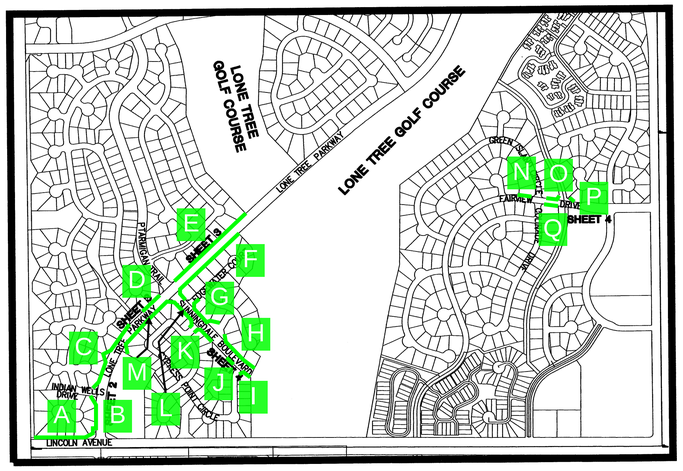
TST INC. OF DENVER
Consulting Engineers

JOB NO.	
061-101	
SCALE	
1"=40'	
DATE	
APRIL 2003	
SHEETS	SHEET
7	4

2003 FENCE PROGRAM
LONE TREE

PLAN SET NO.

CONSTRUCTION PLANS
FOR
THE CITY OF LONE TREE
2003 FENCE PROGRAM-PHASE TWO
CITY OF LONE TREE, COLORADO
NOVEMBER 2003



VICINITY MAP
SCALE: 1"=600'

SHEET INDEX

TST
TST INC. of DENVER
Consulting Engineers

GENERAL NOTES

1. All materials and workmanship shall be subject to inspection by the City of Lone Tree Engineering Division. The City reserves the right to accept or reject any such materials and workmanship that does not conform to its Standards and Specifications.

2. The Contractor shall notify the City of Lone Tree Engineering Division Inspection Section, (303) 662–8112, a minimum of 48 hours and a maximum of 96 hours prior to starting construction.

3. Locations of the existing utilities shown have been determined from the best available information. Location of existing utilities shall be verified by the Contractor prior to actual construction. For information, contact: UNCC at (800) 922–1987.

4. The Contractor shall have one (1) signed copy of the plans at the job site at all times.

5. A plan for traffic control during construction shall be submitted to the City of Lone Tree Engineer for acceptance with the permit application.

6. The Contractor is responsible for the timely notification of all the appropriate agencies prior to construction.

7. All existing structures including fences, signs, and improvements destroyed, damaged or removed due to the construction of the project shall be replaced or restored in like and kind at the Contractor's expense, unless otherwise indicated on drawings or included in the contract as refurbished landscaping.

8. The Contractor shall coordinate with the City and affected Residents as to the construction schedule and notification to all affected parties. At least fourteen (14) days prior to removal of the existing wood fence, Contractor shall place a notice on each home's front door indicating that Contractor expects to be removing the fence on an estimated dte. This notice shall include a phone number for the resident to schedule a time to meet with Contractor's representative. This phone number shall be answered by a representative of Contractor during the hours of 8:00 a.m. to 5:00 p.m., Monday through Friday and provide the option to leave a message during other hours. The Contractor and a City representative will attempt to meet with effected homeowner approximately one week prior to removal of that homeowner's fence to determine what needs to be removed or relocated in the yards.

9. The Contractor shall be responsible for all back filling after form removal.

10. The Contractor shall be responsible for obtaining a disposal site for all material removed from the project.

11. Contractor shall limit encroachment in the yards of homeowners to eighteen (18) inches unless expressly approved by City representative.

12. Contractor shall make best efforts to avoid damage to landscaping, sprinkler systems and other existing improvements.

13. Contractor shall install plastic construction fence across the back yard immediately after the fence has been removed. Fence shall be maintained until the brick fence is complete on that lot and shall then be promptly removed by Contractor.

14. No more than seven (7) days may elapse between removal of existing fence on any lot and completion of the new brick fence.

15. Landscape repairs shall be completed on each lot within five days of completion of the brick fence on said lot.

16. Final proposed brick fence alignment to be determined by Owner's Representative in the field.

17. All landscaping located on the Right–of–Way side of the fence adjacent to Lone Tree Parkway is subject to removal at the discretion of the Contractor and Owner's Representative.

18. All existing brick columns and caissons within alignment of proposed fence shall be removed. Existing caissons shall be removed to a depth of at least 18 inches below grade.

19. Contractor is responsible for removal and disposal, off site, of all excess soil from caisson drilling, removed fence material, removed brick, removed vegetation and any other excess materials and debris.

Dig Safely.
1.800.922.1987
www.uncc.org

CERTIFIED CONSULTING ENGINEER 255 COLORADO
JOHN P. COTTEN

COLORADO REGISTERED JOHN P. COTTEN 11-17-03 18007 PROFESSIONAL ENGINEER

MATCH LINE SEE BELOW

Section A Start P2-001

Section A End P2-030

Section B Start P2-031

P2-026

P2-025

P2-022

P2-023

EXISTING POWER METERS

190.63'

70.52'

70.54'

104.83'

125.80'

52.56'

13.30'

19.82'

50.47'

30.39'

BEGIN 8' HIGH SECTION, TIE INTO EXISTING AT CORNER

LINCOLN AVENUE

LONE TREE PARKWAY

END 8' HIGH SECTION, BEGIN 6' HIGH SECTION

NOTES:
- ALL TREES TO REMAIN WHEN POSSIBLE.
- ALL EXISTING SPRINKLER TO REMAIN, IF DAMAGED SPRINKLER SYSTEM MUST BE REPAIRED.

LEGEND

- BUSH
- DECIDUOUS TREE
- CONIFEROUS TREE
- EXISTING FL
- EXISTING WALL TO REMAIN
- EXISTING FENCE TO BE REPLACED
- PROPOSED FENCE COLUMN
- EXISTING SHRUB BOUNDARIES

40 0 40 80
scale 1"=40' feet

MATCH LINE SEE SHEET 3

73.85'

TIE INTO EXISTING AT CORNER

Section M End P2-294

88.40'

70.47'

101.53'

39.96'

35.23'

45.58'

29.15'

117.58'

46.22'

P2-049

P2-050

P2-048

38.58'

TIE INTO EXISTING AT CORNER

Section C Start P2-047

parking lot

INDIAN WELLS DRIVE

TIE INTO EXISTING AT CORNER

Section B End P2-046

86.37'

20.00'

125.80'

52.56'

13.30'

19.82'

50.47'

20.62'

EXISTING POWER METERS

LONE TREE PARKWAY

Section B Start P2-031

Section A End P2-030

END 8' HIGH SECTION, BEGIN 6' HIGH SECTION

MATCH LINE SEE ABOVE

40 0 40 80
scale 1"=40' feet

LEGEND

- BUSH
- DECIDUOUS TREE
- CONIFEROUS TREE
- EXISTING FL
- EXISTING WALL TO REMAIN
- EXISTING FENCE TO BE REPLACED
- PROPOSED FENCE COLUMN
- EXISTING SHRUB BOUNDARIES

NOTES:
- ALL TREES TO REMAIN WHEN POSSIBLE.
- ALL EXISTING SPRINKLER TO REMAIN, IF DAMAGED SPRINKLER SYSTEM MUST BE REPAIRED.

REVISIONS

Description	Date	By

DESIGNED MLK
CHECKED TCG
VIEW FNC-1
FILE FENCE-PH2

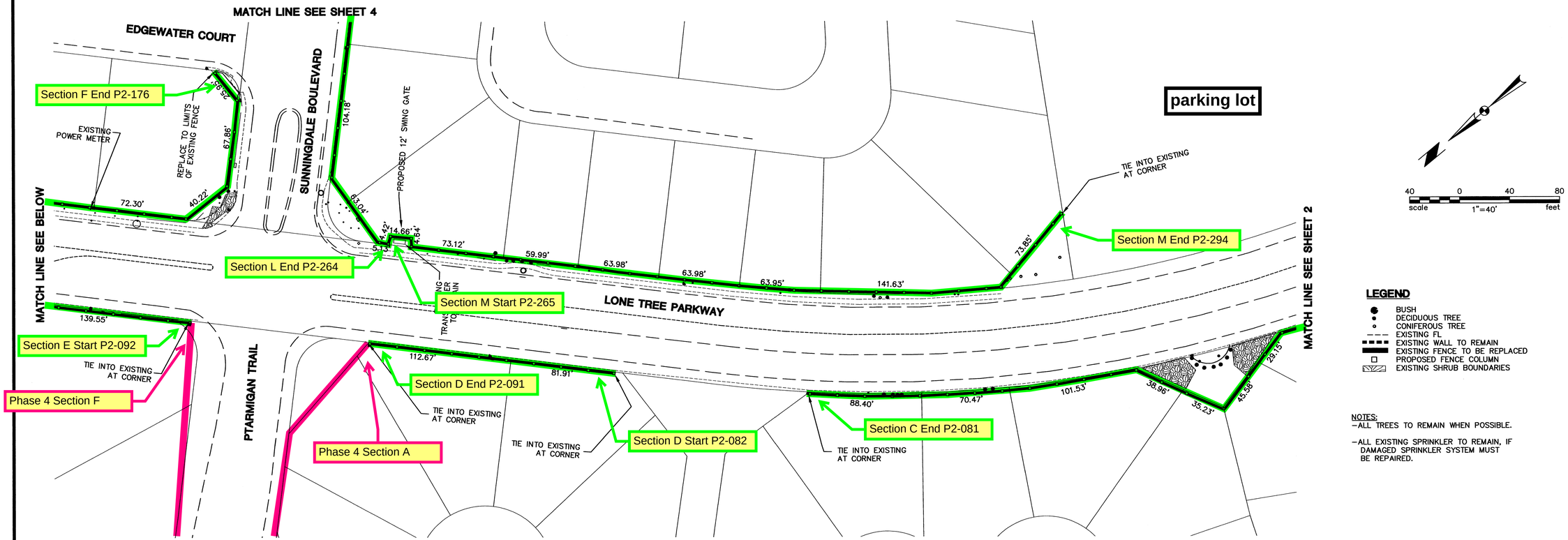
COLORADO REGISTERED
JOHN P. COTTEN
11-11-03
18007
PROFESSIONAL ENGINEER

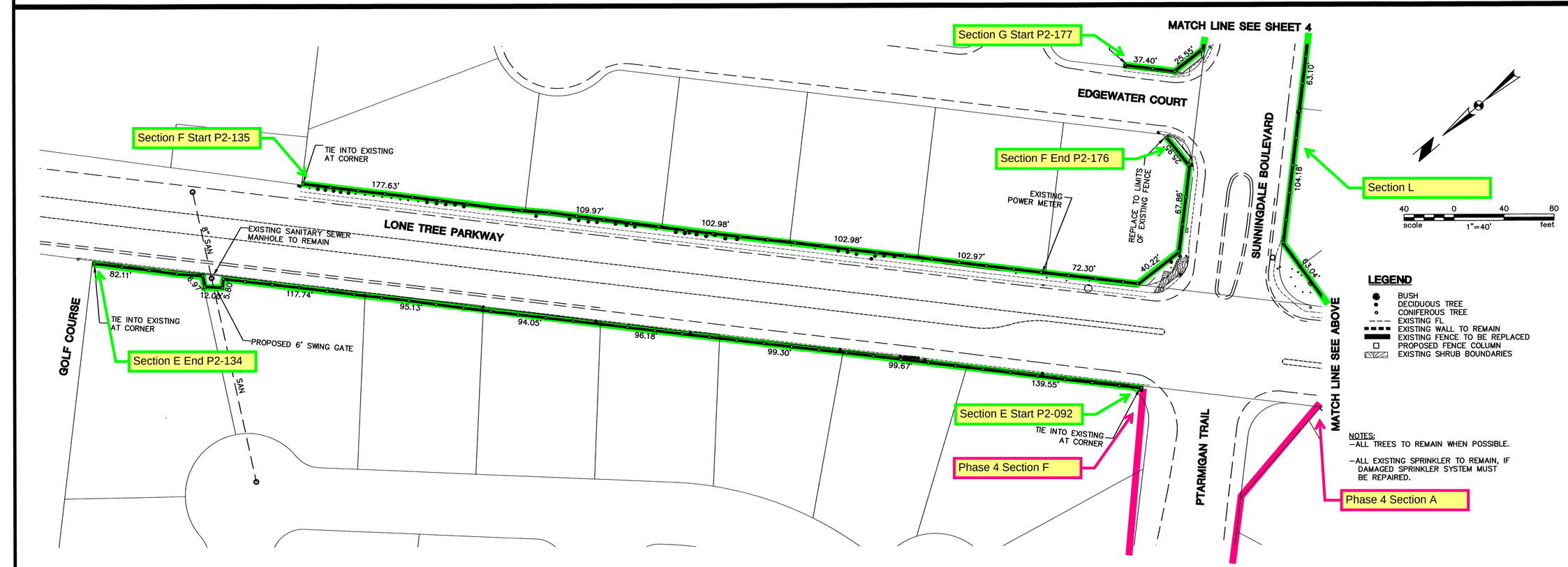
CERTIFIED CONSULTING ENGINEER 255 COLORADO
JOHN P. COTTEN

CITY OF LONE TREE
2003 FENCE PROGRAM-PHASE TWO
LINCOLN AVENUE & LONE TREE PARKWAY

TST
TST INC. OF DENVER
Consulting Engineers

JOB NO. 061-128
SCALE 1"=40'
DATE NOVEMBER 2003
SHEETS 7
SHEET 2





REVISIONS
No. | Description | Date | By

DESIGNED MLK
CHECKED TCG
VIEW FNC–2
FILE FENCE–PH2

COLORADO REGISTERED JOHN P. COTTEN 18007 PROFESSIONAL ENGINEER

CERTIFIED CONSULTING 255 COLORADO ENGINEER
JOHN P. COTTEN

CITY OF LONE TREE
2003 FENCE PROGRAM-PHASE TWO
LONE TREE PARKWAY

TST
TST INC. OF DENVER
Consulting Engineers

JOB NO. 061–128
SCALE 1"=40'
DATE JULY 2003
SHEETS 7
SHEET 3

MATCH LINE SEE SHEET 3

MATCH LINE SEE SHEET 3

MATCH LINE SEE SHEET 3

EDGEWATER COURT

SUNNINGDALE BOULEVARD

SUNNINGDALE BOULEVARD

CYPRESS POINT CIRCLE

CYPRESS POINT CIRCLE

Section F End P2-176

Section G Start P2-177

Section G End P2-195

Section H Start P2-196

Section H End P2-217

Section I Start P2-218

Section I End P2-224

Section J Start P2-225

Section J End P2-229

Section K Start P2-230

Section K End P2-242

Section L End P2-264

Section L Start P2-243

Section M Start P2-265

REPLACE TO LIMITS OF EXISTING FENCE

EXISTING POWER METER

EXISTING FIRE HYDRANT TO REMAIN

TIE INTO EXISTING AT CORNER

EXISTING RETAINING WALLS TO REMAIN

TIE INTO EXISTING

PROPOSED 12' SWING GATE OVER EXISTING SANITARY SEWER

TIE INTO EXISTING AT CORNER

EXISTING FIRE HYDRANT TO REMAIN

PROPOSED 12' SWING GATE

TIE INTO EXISTING AT CORNER

EXISTING TRANSFORMER TO REMAIN

TIE INTO EXISTING AT CORNER

REPLACE FENCE TO EXTENTS OF EXISTING FENCE

EXISTING SPLIT RAIL FENCE TO REMAIN

TIE INTO EXISTING AT CORNER

TIE INTO EXISTING AT CORNER

REPLACE FENCE TO EXTENTS OF EXISTING FENCE

REPLACE FENCE TO EXTENTS OF EXISTING FENCE

TIE INTO EXISTING AT CORNER

72.30'

139.55'

40.22'

67.86'

25.95'

37.40'

25.55'

62.86'

92.96'

28.37'

81.68'

64.97'

39.12'

166.46'

119.70'

104.18'

63.10'

41.99'

31.28'

35.95'

63.04'

31.13'

14.66'

4.64'

73.12'

31.58'

55.87'

79.04'

34.96'

83.65'

73.81'

35.84'

NOTES:
-ALL TREES TO REMAIN WHEN POSSIBLE.

-ALL EXISTING SPRINKLER TO REMAIN, IF DAMAGED SPRINKLER SYSTEM MUST BE REPAIRED.

LEGEND

- BUSH
- DECIDUOUS TREE
- CONIFEROUS TREE
- EXISTING FL
- EXISTING WALL TO REMAIN
- EXISTING FENCE TO BE REPLACED
- PROPOSED FENCE COLUMN
- EXISTING SHRUB BOUNDARIES

golf club parking lot

scale 1"=40' feet (40 0 40 80)

GREEN ISLAND CIRCLE

COLINADE DRIVE

FAIRVIEW DRIVE

Section N Start P2-295

Section N End P2-307

Section O Start P2-308

Section O End P2-316

Section P Start P2-317

Section P End P2-320

Section Q End P2-331

Section Q Start P2-321

P2-297

P2-305

P2-310

P2-325

Fairways

Fairways

TIE INTO EXISTING AT CORNER

REPLACE FENCE TO EXTENTS OF EXISTING FENCE

TIE INTO EXISTING AT CORNER

REPLACE TO EXTENTS OF WOOD FENCE

TIE INTO EXISTING AT CORNER

EXISTING SPLIT RAIL FENCE TO REMAIN

TIE INTO EXISTING AT CORNER

REPLACE TO EXTENTS OF WOOD FENCE

EXISTING SPLIT RAIL FENCE TO REMAIN

15.16'

72.51'

71.60'

44.65'

34.89'

8.91'

102.90'

LEGEND

- BUSH
- DECIDUOUS TREE
- CONIFEROUS TREE
- EXISTING FL
- EXISTING WALL TO REMAIN
- EXISTING FENCE TO BE REPLACED
- PROPOSED FENCE COLUMN
- EXISTING SHRUB BOUNDARIES

NOTES:
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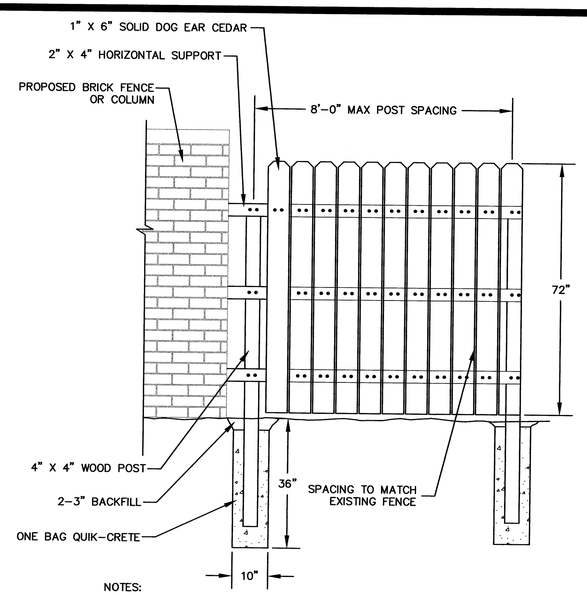
scale 1"=30' feet (30 0 30 60)



NOTES:

1.) PLACE 1" X 6" DOG EAR CEDAR SLATS BEGINNING AT END OF BRICK FENCE COLUMN.

2.) PLACE ADDITIONAL 4" X 4" WOOD POSTS AS NEEDED.

3.) ALL CONNECTIONS TO BE CONSTRUCTED WITH 16-PENNY GALVANIZED STEEL NAILS.

4.) STAIN WOOD TO MATCH EXISTING.

5.) WOOD FENCE TO BE EXTENDED AND TIED-IN TO BRICK FENCE AT ALL FENCE JUNCTIONS.

WOOD FENCE EXTENSION & TIE-IN

REVISIONS: Description | Date | By

DESIGNED MLK
CHECKED TCG
VIEW FNC-3
FILE FENCE-PH2

COLORADO REGISTERED JOHN P. COTTEN 11-11-03 18007 PROFESSIONAL ENGINEER

CERTIFIED CONSULTING ENGINEER 255 COLORADO

JOHN P. COTTEN

CITY OF LONE TREE
2003 FENCE PROGRAM-PHASE TWO

SUNNINGDALE BOULEVARD/FAIRVIEW DRIVE

TST

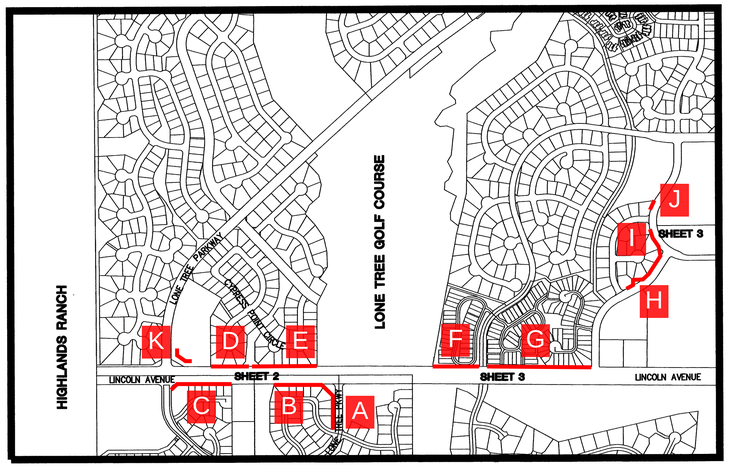
TST INC. OF DENVER
Consulting Engineers

JOB NO. 061-128
SCALE See Drawing
DATE JULY 2003
SHEETS 7
SHEET 4

2004 FENCE PROGRAM
LONE TREE

PLAN SET NO.

CONSTRUCTION PLANS
FOR
THE CITY OF LONE TREE
2004 FENCE PROGRAM-PHASE THREE
CITY OF LONE TREE, COLORADO
JULY 2004



VICINITY MAP
SCALE: 1"=600'

SHEET INDEX

TST
TST INC. of DENVER
Consulting Engineers

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9. The Contractor shall be responsible for all back filling after form removal and potholing.

10. The Contractor shall be responsible for obtaining a disposal site for all material removed from the project.

11. Contractor shall limit encroachment in the yards of homeowners to eighteen (18) inches unless expressly approved by City representative.

12. Contractor shall make best efforts to avoid damage to landscaping, sprinkler systems and other existing improvements.

13. Contractor shall install plastic construction fence across the back yard immediately after the fence has been removed. Fence shall be maintained until the brick fence is complete on that lot and shall then be promptly removed by Contractor.

14. No more than ten (10) days may elapse between removal of existing fence on any lot and completion of the new brick fence.

15. Landscape repairs and Fence Tie–ins shall be completed on each lot within seven (7) days of completion of the brick fence on said lot.

16. No more than 500 lineal feet of fence may be open per crew at one time.

17. Final proposed brick fence alignment to be determined by Owner's Representative in the field.

18. All landscaping located on the Right–of–Way side of the fence adjacent to Lincoln Avenue is subject to removal at the discretion of the Contractor and Owner's Representative.

19. All existing brick columns and caissons within alignment of proposed fence shall be removed. Existing caissons shall be removed to a depth of at least 18 inches below grade.

20. Contractor shall be responsible for removal and disposal, off site, of all excess soil from caisson drilling, removed fence material, removed brick, removed vegetation and any other excess materials and debris.

Dig Safely.
1.800.922.1987
www.uncc.org

CERTIFIED CONSULTING ENGINEER 255

COLORADO REGISTERED JOHN P. COTTEN 18007 PROFESSIONAL ENGINEER

JOHN P. COTTEN

Phase 2

Section K Start P3-215

Section K End P3-217

LONE TREE PARKWAY (W)

BEGIN 8' HIGH SECTION
REPLACE FENCE TO EXTENTS
OF EXISTING FENCE

Section D Start P3-075

REPLACE FENCE TO EXTENTS
OF EXISTING FENCE

REPLACE FENCE TO EXTENTS
OF EXISTING FENCE

92.25' 130.57' 36.01' 87.41' 9' 63.53' 111.50' 67.32'

Section D End P3-091

Section E Start P3-092

8' SWING GATE
VERIFY LOCATION OF SANITARY SEWER
WITH SOUTHGATE SANITATION DISTRICT
AND CENTER GATE OVER PIPE
SWING GATE TO R.O.W. SIDE

MATCH LINE SEE BELOW

NOTES:
-ALL TREES TO REMAIN WHEN POSSIBLE.

-ALL EXISTING SPRINKLER TO REMAIN, IF DAMAGED SPRINKLER SYSTEM MUST BE REPAIRED.

-LANDSCAPING REHABILITATION ON THE RIGHT-OF-WAY SIDE OF THE FENCE SHALL INCLUDE, BUT NOT LIMITED TO 18" OF LANDSCAPE ROCK, STEEL EDGING, & LANDSCAPE FABRIC AS DIRECTED BY OWNER'S REPRESENTATIVE IN FIELD.

LINCOLN AVENUE

ANGLE POINT OF FENCE

FENCE TIE-IN
(TYPICAL)

END 8' HIGH SECTION
TIE INTO EXISTING
WOOD FENCE

BEGIN 8' HIGH SECTION
TIE INTO EXISTING
WOOD FENCE

P3-070

P3-074
sign

Section C Start P3-045

Section B End P3-044

99.90' 54.03' 57.10' 60.00' 60.00' 60.00' 46.94' 64.78' 127.38'

EXISTING RIP-RAP
TO REMAIN

5.57'

Section C End P3-073
plus sign

40 0 40 80
scale 1"=40' feet

Section B Start P3-025

Section A End P3-024

MATCH LINE SEE LEFT

98.18' 16.76' 107.50'

BEGIN 6' HIGH SECTION
END HEIGHT TAPER

P3-018

LONE TREE PARKWAY (E)

MATCH LINE SEE SHEET 3

33.78' 77.61' 60.00' 96.46'

P3-005

END 8' HIGH SECTION
TIE INTO EXISTING
WOOD FENCE

Section A Start P3-001

EXISTING TRANSFORMER
& UTILITY BOXES NOT TO
BE DISTURBED

tennis
courts

MATCH LINE SEE ABOVE

67.32' 60.89' 66.74' 124.18' 41.41'

Section E End P3-118

END 8' HIGH SECTION
TIE INTO EXISTING
WOOD FENCE

40 0 40 80
scale 1"=40' feet

LINCOLN AVENUE

BEGIN 8' HIGH SECTION
TIE INTO EXISTING
WOOD FENCE

FENCE TIE-IN
(TYPICAL)

END 8' HIGH SECTION
BEGIN HEIGHT TAPER
(4" DROP PER SECTION)

Section B End P3-044

Section B Start P3-025

Section A End P3-024

127.38' 60.00' 60.00' 60.00' 98.18' 16.76' 107.50'

BEGIN 6' HIGH SECTION
END HEIGHT TAPER

BRONTI CIRCLE

LONE TREE PARKWAY (E)

33.78' 61'

MATCH LINE SEE RIGHT

BRONTI CIRCLE

LONE TREE PARKWAY (E)

33.78' 77.61' 60.00' 96.46'

MATCH LINE SEE SHEET 3

40 0 40 80
scale 1"=40' feet

NOTES:
-ALL TREES TO REMAIN WHEN POSSIBLE.

-ALL EXISTING SPRINKLER TO REMAIN, IF DAMAGED SPRINKLER SYSTEM MUST BE REPAIRED.

-LANDSCAPING REHABILITATION ON THE RIGHT-OF-WAY SIDE OF THE FENCE SHALL INCLUDE, BUT NOT LIMITED TO 18" OF LANDSCAPE ROCK, STEEL EDGING, & LANDSCAPE FABRIC AS DIRECTED BY OWNER'S REPRESENTATIVE IN FIELD.

REVISIONS
Description
Date
By

DESIGNED CJC
CHECKED
VIEW CJC
FILE ROAD5

COLORADO REGISTERED
JOHN P. COTTEN
11-8-04
18007
PROFESSIONAL ENGINEER

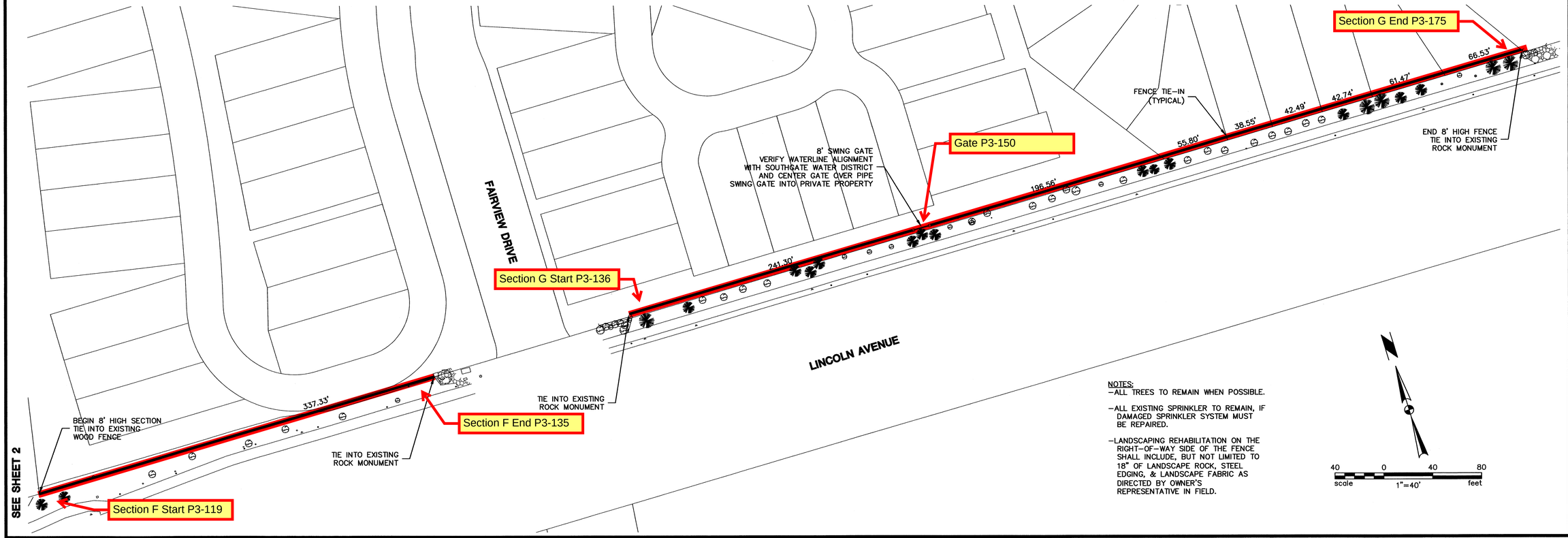
CERTIFIED CONSULTING
255
COLORADO
ENGINEER
JOHN P. COTTEN

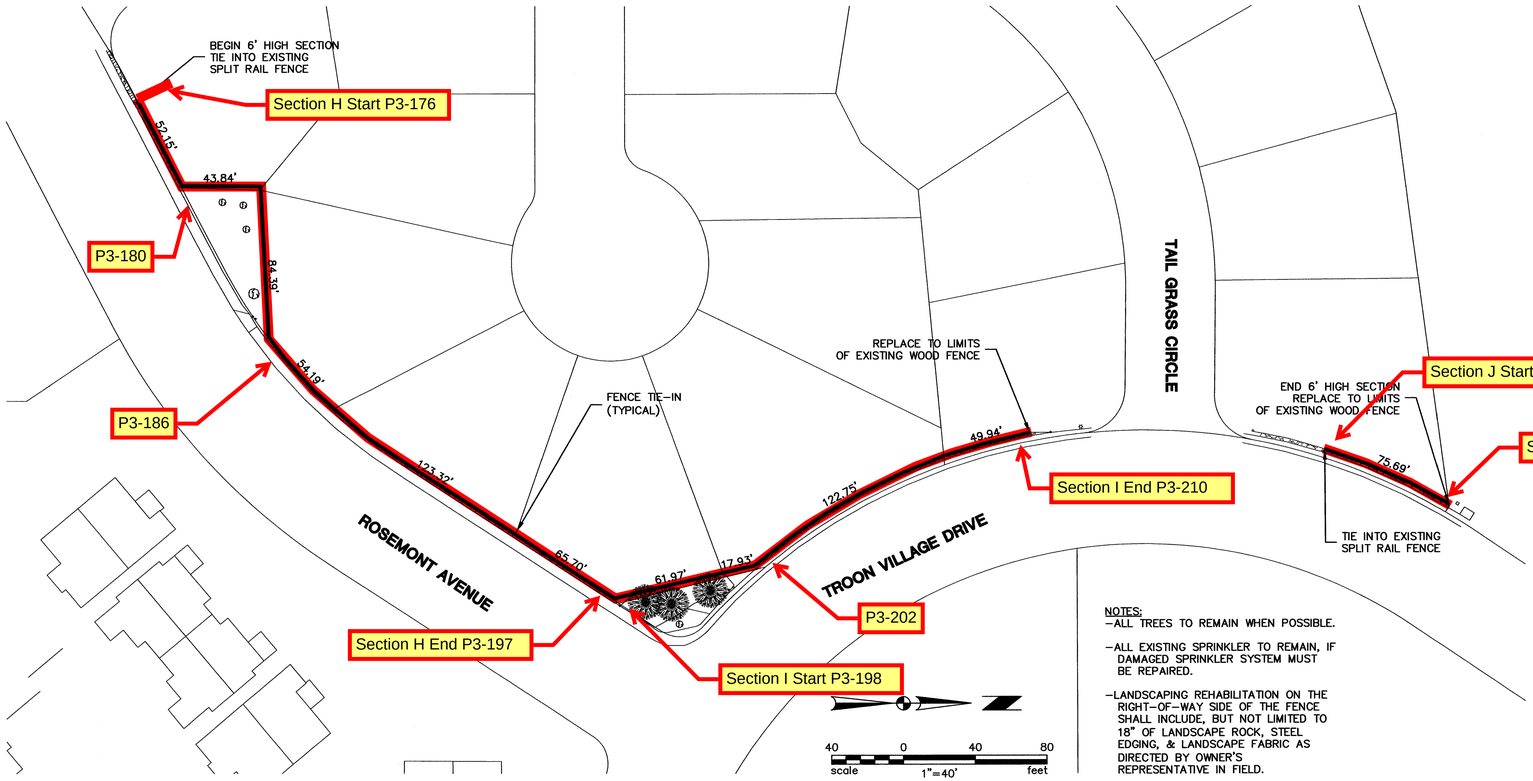
CITY OF LONE TREE
2004 FENCE PROGRAM -PHASE III

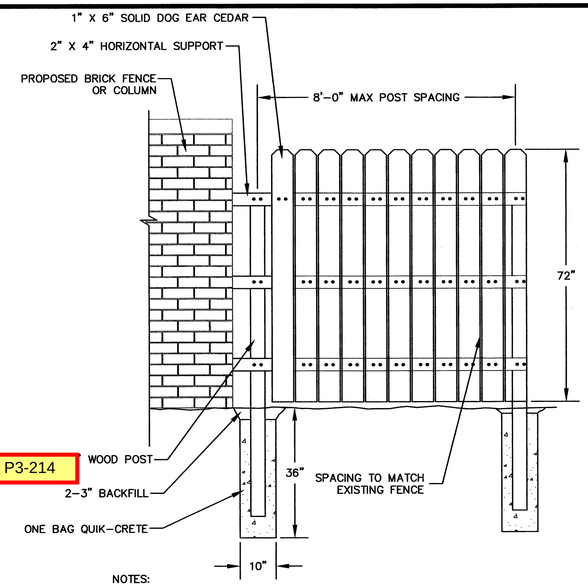
LINCOLN AVENUE/LONE TREE PARKWAY

TST
TST INC. OF DENVER
Consulting Engineers

JOB NO. 061-144
SCALE 1"=40'
DATE JULY 2004
SHEETS 6
SHEET 2







NOTES:

1.) PLACE 1" X 6" DOG EAR CEDAR SLATS BEGINNING AT END OF BRICK FENCE COLUMN.

2.) PLACE ADDITIONAL 4" X 4" WOOD POSTS AS NEEDED.

3.) ALL CONNECTIONS TO BE CONSTRUCTED WITH 16-PENNY GALVANIZED STEEL NAILS.

4.) STAIN WOOD TO MATCH EXISTING.

5.) WOOD FENCE TO BE EXTENDED AND TIED-IN TO BRICK FENCE AT ALL FENCE JUNCTIONS.

WOOD FENCE EXTENSION & TIE-IN

REVISIONS

By	Date	Description

DESIGNED CJC

CHECKED

VIEW CJC

FILE ROAD5

COLORADO REGISTERED JOHN P. COTTEN 18007 PROFESSIONAL ENGINEER

CERTIFIED CONSULTANT 255 COLORADO ENGINEER JOHN P. COTTEN

CITY OF LONE TREE
2004 FENCE PROGRAM-PHASE III

LINCOLN AVENUE/ROSEMONT AVENUE

TST

TST INC. OF DENVER
Consulting Engineers

JOB NO. 061-144

SCALE 1"=40'

DATE JULY 2004

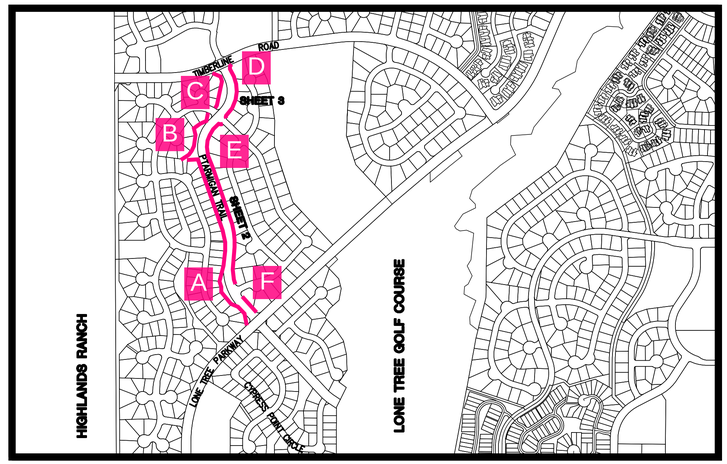
SHEETS 6

SHEET 3

2005 FENCE PROGRAM
LONE TREE

PLAN SET NO.

CONSTRUCTION PLANS
FOR
THE CITY OF LONE TREE
2005 FENCE PROGRAM-PHASE FOUR
CITY OF LONE TREE, COLORADO
MAY 2005



VICINITY MAP
SCALE: 1"=600'

SHEET INDEX

TST
TST INC. of DENVER
Consulting Engineers

GENERAL NOTES

1. All materials and workmanship shall be subject to inspection by the City of Lone Tree Engineering Division. The City reserves the right to accept or reject any such materials and workmanship that does not conform to its Standards and Specifications.

2. The Contractor shall notify the City of Lone Tree Engineering Division Inspection Section, (303) 662-8112, a minimum of 48 hours and a maximum of 96 hours prior to starting construction.

3. Locations of the existing utilities shown have been determined from the best available information. Location of existing utilities shall be verified by the Contractor prior to actual construction. For information, contact: UNCC at (800) 922-1987.

4. The Contractor shall have one (1) signed copy of the plans at the job site at all times.

5. A plan for traffic control during construction shall be submitted to the City of Lone Tree Engineer for acceptance with the permit application.

6. The Contractor is responsible for the timely notification of all the appropriate agencies prior to construction.

7. All existing structures including fences, signs, and improvements destroyed, damaged or removed due to the construction of the project shall be replaced or restored in like and kind at the Contractor's expense, unless otherwise indicated on drawings or included in the contract as refurbished landscaping.

8. The Contractor shall coordinate with the City and affected Residents as to the construction schedule and notification to all affected parties. At least fourteen (14) days prior to removal of the existing wood fence, Contractor shall place a notice on each home's front door indicating that Contractor expects to be removing the fence on an estimated dte. This notice shall include a phone number for the resident to schedule a time to meet with Contractor's representative. This phone number shall be answered by a representative of Contractor during the hours of 8:00 a.m. to 5:00 p.m., Monday through Friday and provide the option to leave a message during other hours. The Contractor and a City representative will attempt to meet with effected homeowner approximately one week prior to removal of that homeowner's fence to determine what needs to be removed or relocated in the yards.

9. The Contractor shall be responsible for all back filling after form removal and potholing.

10. The Contractor shall be responsible for obtaining a disposal site for all material removed from the project.

11. Contractor shall limit encroachment in the yards of homeowners to eighteen (18) inches unless expressly approved by City representative.

12. Contractor shall make best efforts to avoid damage to landscaping, sprinkler systems and other existing improvements.

13. Contractor shall install plastic construction fence across the back yard immediately after the fence has been removed. Fence shall be maintained until the brick fence is complete on that lot and shall then be promptly removed by Contractor.

14. No more than ten (10) days may elapse between removal of existing fence on any lot and completion of the new brick fence.

15. Landscape repairs and Fence Tie-ins shall be completed on each lot within seven (7) days of completion of the brick fence on said lot.

16. No more than 500 lineal feet of fence may be open per crew at one time.

17. Final proposed brick fence alignment to be determined by Owner's Representative in the field.

18. All landscaping located on the Right-of-Way side of the fence adjacent to Lincoln Avenue is subject to removal at the discretion of the Contractor and Owner's Representative.

19. All existing brick columns and caissons within alignment of proposed fence shall be removed. Existing caissons shall be removed to a depth of at least 18 inches below grade.

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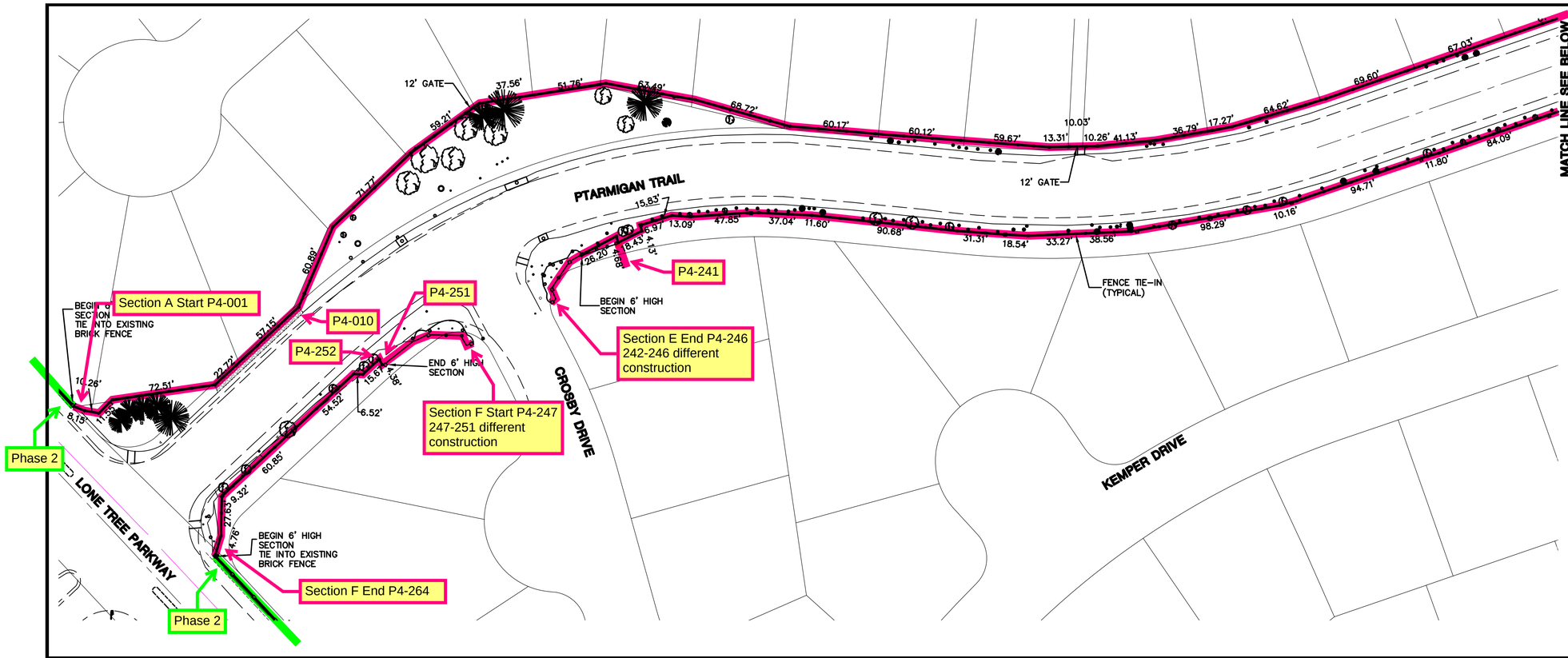
Dig Safely.
1.800.922.1987
www.uncc.org

CERTIFIED CONSULTING ENGINEER 255
JOHN P. COTTEN

COLORADO REGISTERED JOHN P. COTTEN 18007 PROFESSIONAL ENGINEER



NOTES:
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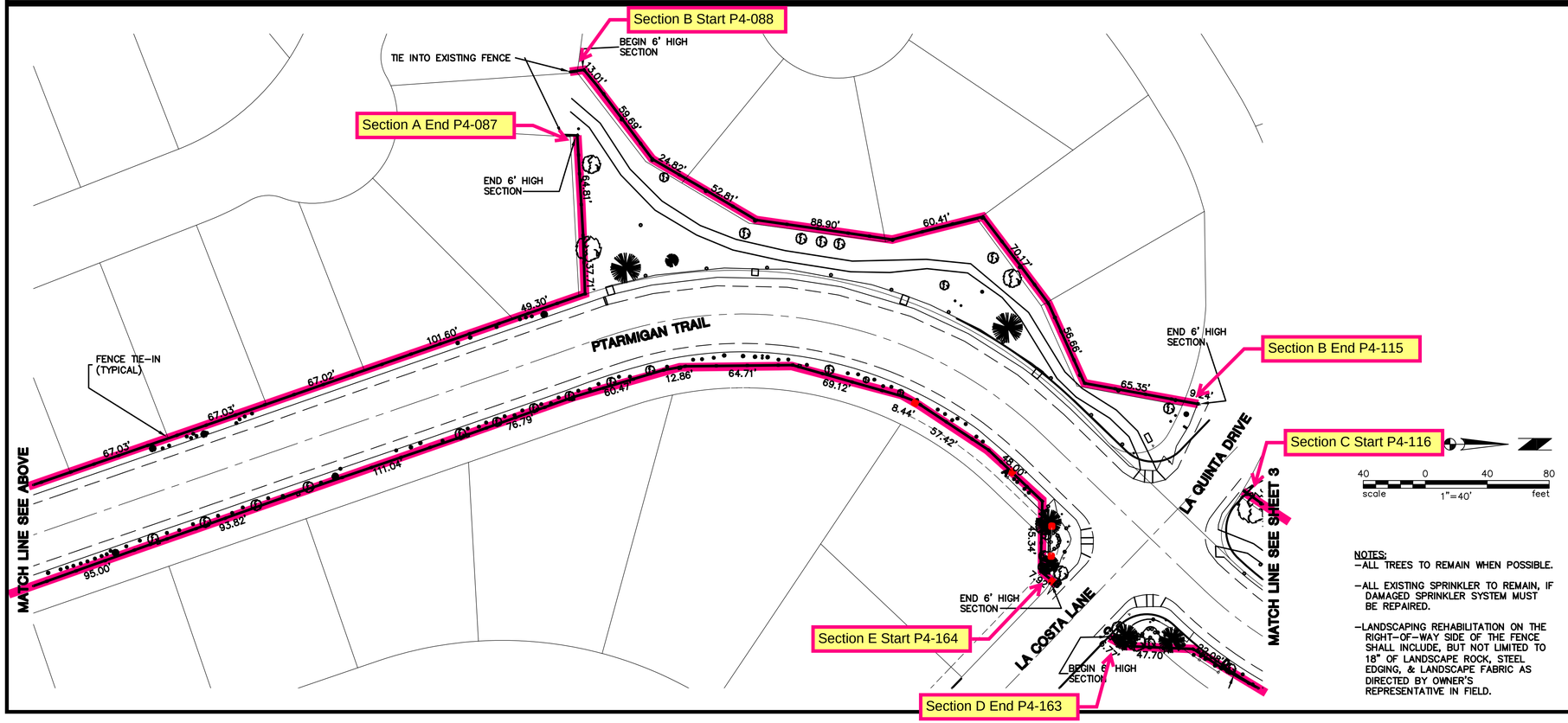

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REVISIONS
Description | Date | By

DESIGNED GW
CHECKED TLG
VIEW FNC-1
FILE 02-CDS

COLORADO REGISTERED JOHN P. COTTEN 18007 PROFESSIONAL ENGINEER

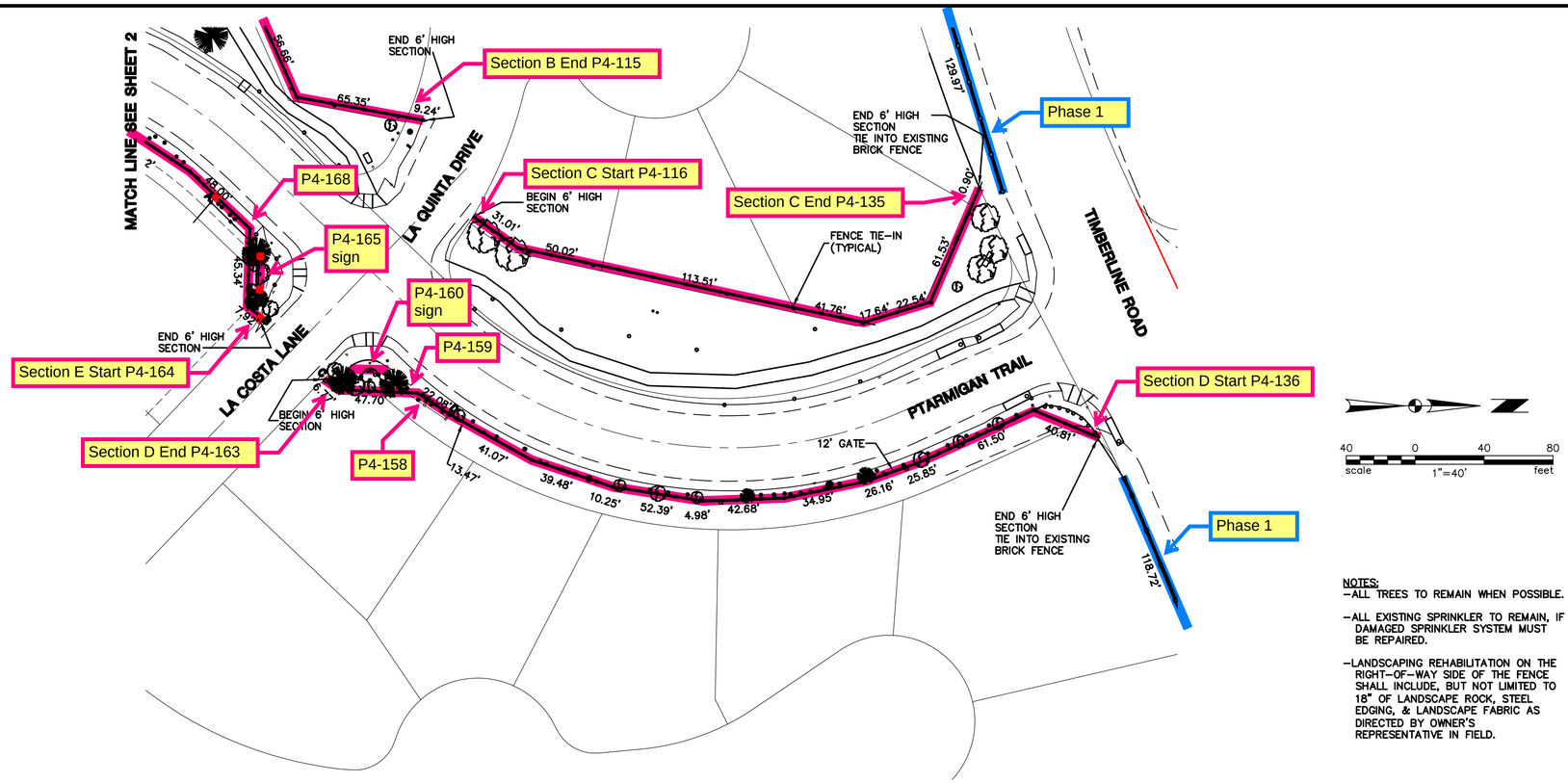
CERTIFIED CONSULTANTS 255 COLORADO ENGINEER
JOHN P. COTTEN

CITY OF LONE TREE
2005 FENCE PROGRAM -PHASE IV

PTARMIGAN TRAIL-SOUTH

TST INC. OF DENVER
Consulting Engineers

JOB NO. 061-167
SCALE 1"=40'
DATE MAY 2005
SHEETS 6
SHEET 2



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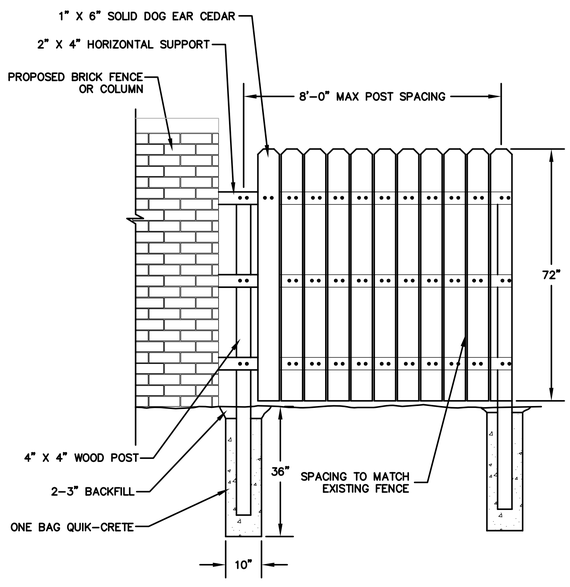

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WOOD FENCE EXTENSION & TIE-IN

REVISIONS: Description | Date | By

DESIGNED GW
CHECKED TLG
VIEW FNC–2
FILE 02–CDS

COLORADO REGISTERED JOHN P. COTTEN 18007 PROFESSIONAL ENGINEER

CERTIFIED CONSULTING 225 COLORADO ENGINEER
JOHN P. COTTEN

CITY OF LONE TREE
2005 FENCE PROGRAM–PHASE IV

PTARMIGAN TRAIL–NORTH

TST
TST INC. OF DENVER
Consulting Engineers

JOB NO. 061–167
SCALE 1"=40'
DATE MAY 2005
SHEETS 6
SHEET 3

CONSTRUCTION PLANS

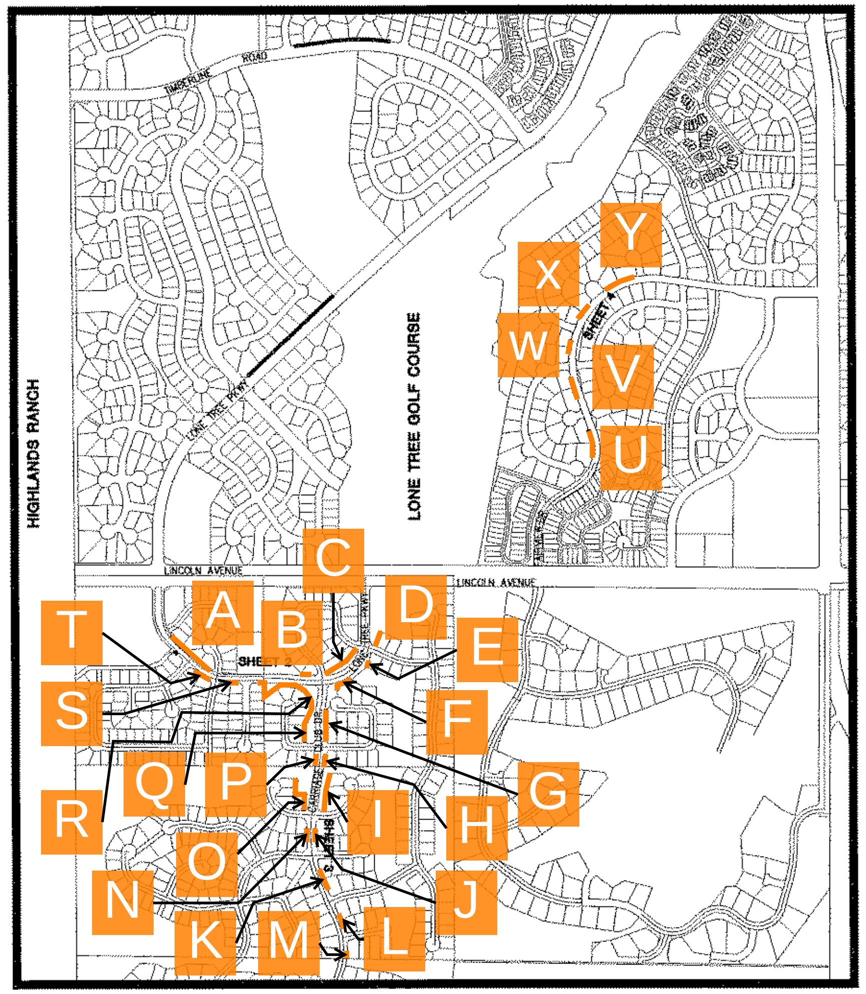
FOR

THE CITY OF LONE TREE
2006 FENCE PROGRAM-PHASE FIVE
CITY OF LONE TREE, COLORADO

MARCH 1, 2006

SHEET INDEX

N



VICINITY MAP
SCALE: 1"=600'

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CARRIAGE CLUB HOMEOWNERS ASSOCIATION:

JOE STARESINIC — 303-683-6444
9250 E. COSTILLA AVENUE — CELL 720-276-3632
SUITE 460 — FAX 303-471-8713
CENTENNIAL, CO 80112

Dig Safely.
1.800.922.1987
www.uncc.org

TST INC. of DENVER
Consulting Engineers

Section A Start P5-001

Section A End P5-017

Section T End P5-190

Section T Start P5-188

Section R End P5-183

Section S End P5-187

Section S Start P5-184

Section B End P5-021

Bronti Circle

Section B Start P5-018

Section R Start P5-155

Section Q End P5-154

Section B End P5-021

Section C Start P5-022

Section C End P5-033

Section F Start P5-044

Section F End P5-053

Section G Start P5-054

Phase 1 Section A

Section D Start P5-034

Section D End P5-038

Section E Start P5-039

Section E End P5-043

LONE TREE PARKWAY

RATTLE SNAKE DRIVE

TIBURAN COURT

ARMADILLO DRIVE

TETON COURT

BRONTI CIRCLE

CARRIAGE CLUB DRIVE

MONUMENT SIGN FOR CENTENNIAL RIDGE HOA

TIE INTO EXISTING

EXISTING FENCE

START @ EXISTING LANDSCAPE BEDING

MATCH LINE SEE BELOW

MATCH LINE SEE ABOVE

MATCH LINE SEE SHEET 3

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scale 1"=40' feet

DESIGNED KS
CHECKED TLG
VIEW FNC-1
FILE 02-CDS

COLORADO REGISTERED JOHN P. COTTEN 18007 PROFESSIONAL ENGINEER

CERTIFIED CONSULTANTS 255 JOHN P. COTTEN

CITY OF LONE TREE
2006 FENCE PROGRAM -PHASE V
LONE TREE PARKWAY

TST
TST INC. OF DENVER
Consulting Engineers

JOB NO. 051-188
SCALE 1"=40'
DATE FEBRUARY 2006
SHEETS 8
SHEET 2

Section N End P5-123

Section O Start P5-124

Section O End P5-137

Section P End P5-141

Section P Start P5-138

Section Q Start P5-142

Section Q End P5-154

Section R Start P5-155

Section J Start P5-087

Section I End P5-086

Section I Start P5-070

Section H End P5-069

Section H Start P5-066

Section G End P5-065

Section G Start P5-054

Section F End P5-053

Section N Start P5-115

Section N End P5-123

Section M End P5-114

Section M Start P5-111

Section L End P5-110

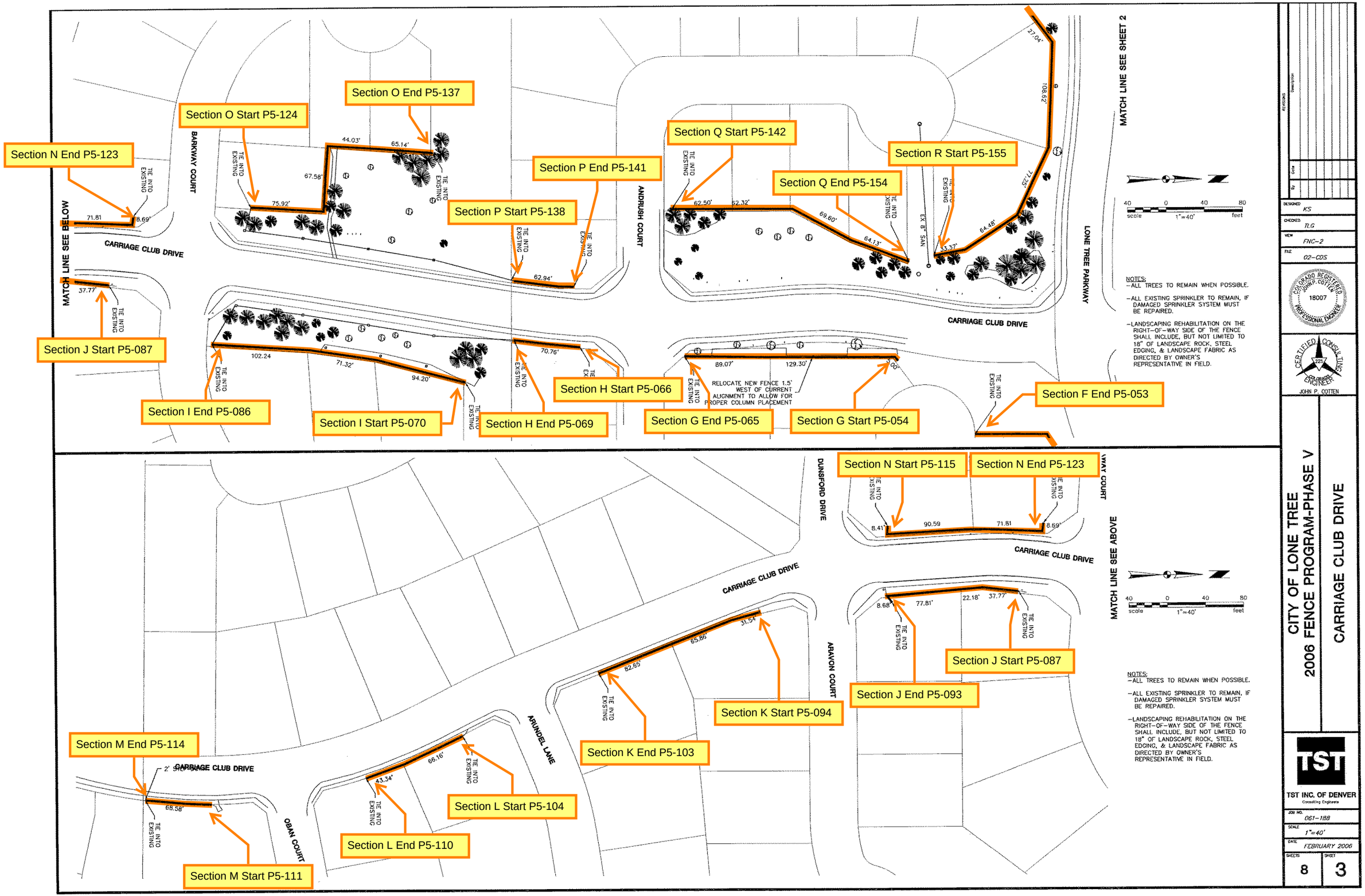
Section L Start P5-104

Section K End P5-103

Section K Start P5-094

Section J End P5-093

Section J Start P5-087



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REVISIONS
DESIGNED KS
CHECKED TLG
VIEW FNC-2
FILE 02-CDS

COLORADO REGISTERED PROFESSIONAL ENGINEER JOHN P. COTTEN 18007

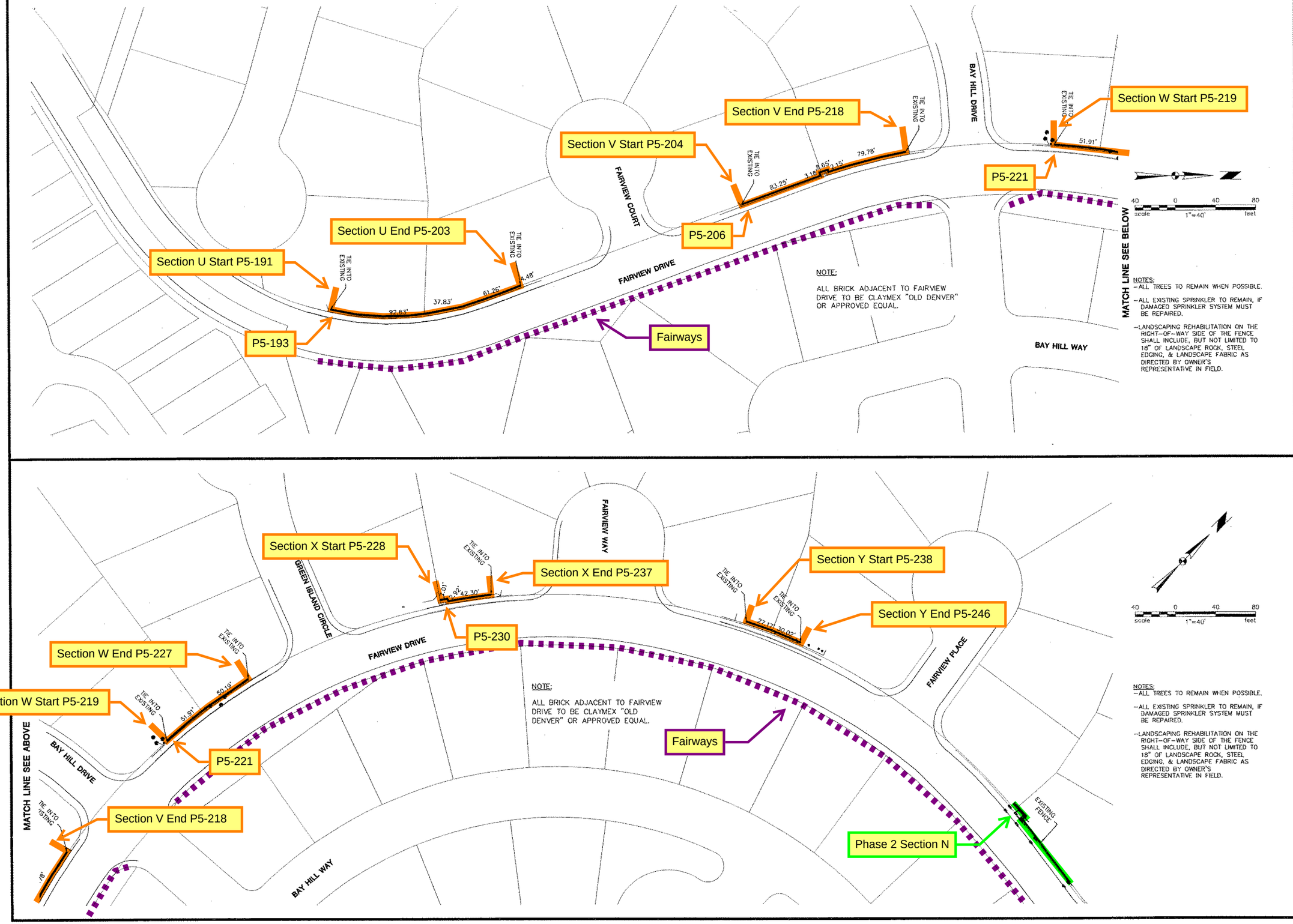
CERTIFIED CONSULTING EXPO CERTIFIED ENGINEER JOHN P. COTTEN 225

CITY OF LONE TREE
2006 FENCE PROGRAM-PHASE V

CARRIAGE CLUB DRIVE

TST
TST INC. OF DENVER
Consulting Engineers

JOB NO. 061-188
SCALE 1"=40'
DATE FEBRUARY 2006
SHEETS 8
SHEET 3



DESIGNED KS
CHECKED TLG
VIEW FNC-2
FILE 02-CDS

COLORADO REGISTERED ENGINEER 18007 PROFESSIONAL ENGINEER

CERTIFIED CONSULTANTS 225 COLORADO ENGINEER
JOHN P. COTTEN

CITY OF LONE TREE
2006 FENCE PROGRAM-PHASE V

FAIRVIEW DRIVE

TST
TST INC. OF DENVER
Consulting Engineers

JOB NO. 061-188
SCALE 1"=40'
DATE FEBRUARY 2006
SHEETS 8
SHEET 4