

Appendix

- E – Concrete Slab Study Final Reports

November 05, 2003
Job No. SJ0086100

James Lindsay
City of Milpitas
455 E. Calaveras Blvd
Milpitas, CA 95035

SUBJECT: Milpitas Midtown Specific Plan, Phase 1 (Task 4) – Main Street Concrete Slab Study

Dear James:

This letter transmits our team's results regarding the study conducted concerning the existing concrete slab along Main Street between Weller Lane and Curtis Avenue. The concrete core drilling operation was performed by Parikh geotechnical consultants on 9/29/03 and 9/30/03. Parikh' results are summarized in the attached letter dated October 8, 2003. The drilling operation anticipated completing 10 cores. However, one core (C-2) was completed in an area where it did not encounter the concrete section therefore an additional core (C-2A) was added to determine the approximate extent of the existing concrete slab in the same area.

Information from City of Milpitas as-builts and Caltrans record drawings states that Main Street was once a main highway. Over the year's asphalt overlays occurred at different times, including sand slurry seal and leveling course for AC overlay on top of the old concrete pavement. Pavement type and thickness obtained from the concrete cores indicate that the northbound lane of Main Street was the original highway alignment. The old concrete pavement appears to be approximately 5± inches in thickness. The southbound lane appears to have been constructed beyond the limits of the old concrete highway as a result of street widening.

In agreement with the analysis by Parikh consultants, the concrete core drilling does not accurately determine the complete limits of the existing concrete slab but does provide a basis for anticipating potential impacts cause by future improvements along the Main Street corridor. Ground Penetration Radar (GPR) or additional pavement cores would be required in order to determine the exact limits of the existing concrete roadway section.

Additional information attached to this summary includes 11x17 inch layout and section sheets (12 total) which are intended to help further summarize the coring results. Further, the information obtained from this study will be used to determine the concrete slabs potential impacts on the proposed improvements being developed by the Nolte/Freedman Tung Bottomley Midtown

August 5, 2005

Page 2

Specific Plan Phase I, Implementation work. Those potential impacts will be reflected in the cost estimates that are being prepared for the upcoming Working Sessions #2 and #3.

If you have questions regarding the above information or need clarification please feel free to contact me directly at (408) 392-7258.

Sincerely,

Nolte Associates, Inc.

Raul Laborin Jr., P.E.



PARIKH
 Practicing in the Geosciences

RECEIVED

OCT 09 2003

NOLTE ASSOCIATES
 SAN JOSE

- Geotechnical ■
- Environmental ■
- Materials Testing ■
- Construction Inspection ■

NOLTE
 1731 North First Street, Suite A
 San Jose, CA, 95112

October 8, 2003
 Job No.: 203131.10

Attn.: Mr. Raul Laborin

Sub: Pavement Coring Data, Main Street between Weller Lane and Curtis Avenue
 Midtown Specific Plan Implementation Phase 1
 City of Milpitas, CA

Dear Mr. Laborin:

As requested, we performed pavement coring along Main Street between Weller Lane and Curtis Avenue for the Midtown Specific Plan Project. Asphalt concrete and old concrete pavement cores in six-inch diameter were obtained at 11 locations. Sets of Site Plans showing the core locations are attached with this data report. The core locations and thickness are summarized in the table below.

Pavement Coring Data

Core Number	Location	Thickness	
		Asphalt (inches)	Concrete (inches)
C-1	Main Street NB lane, south of Weller Lane	8 3/4	4 3/4
C-2*	Main Street SB left turn lane, north of Calaveras Blvd off-ramp	3	--
C-2A	Main Street NB lane, north of Calaveras Blvd off-ramp	10 7/8	4 7/8
C-3	Main Street NB left turn lane, south of Carlo Street	9 1/8	4 3/4
C-4	Main Street NB lane, south of Serra Way	6 5/8	5
C-5	Main Street NB lane, junction at Sinnott Lane	5 7/8	4 3/4
C-6	Main Street SB lane, south of Corning Ave	7 1/2	4 5/8
C-7	Main Street NB lane, north of Hetch Hetchy pipelines	8 7/8	5 1/8
C-8	Main Street SB lane, by "Honda of Milpitas"	7 1/2	4 5/8
C-9	Main Street NB lane, by a temple	10 3/4	8 1/4
C-10	Main Street SB left turn lane, north of Curtis Ave	8	5 1/8

*Note: No old concrete pavement was found at location C-2. At C-2, the core encountered 3 inches of AC over approximately 20 inches of aggregate base.

NOLTE

Job No. 203131.10 (Main Street Coring)

October 8, 2003

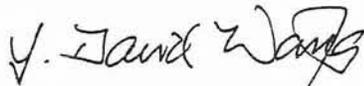
Page 2

The old concrete pavement generally appears to be on the order of 5± inches in thickness. The asphalt concrete cores indicated overlays at different times, including sand slurry seal and leveling course immediately on top of the old concrete pavement for AC overlay. Old concrete pavements were encountered at both NB and SB lanes along Main Street between Carlo Street and Curtis Avenue. From Carlos Street to Weller Lane, it appears that the SB lanes were constructed as a result of street widening, and Core C-2 did not encounter old concrete. We anticipate that the old concrete pavement is along the NB lanes in this segment (the original alignment).

The above discussions are based on the field observation and core samples retrieved. It is expected that the current Main Street layout is a result of revision/ modification of the original street alignment and width over the years. Therefore, the exact location and horizontal extent of the old concrete pavement cannot be fully delineated by limited number of cores and may still be a variable in design. Geophysical methods such as Ground Penetration Radar (GPR) may be required if it is desirable to accurately locate the old concrete pavement.

Please be advised that we are performing a professional service and that our conclusions are professional opinions only. All work done and all recommendations made are in accordance with generally accepted geotechnical engineering principles and practices. No warranty, expressed or implied, of merchantability or fitness, is made or intended in connection with our work.

Very truly yours,
PARIKH CONSULTANTS, INC.



Y. David Wang, Ph.D., P.E., 52911
Senior Engineer



Attachments: Pictures of Pavement Cores
Site Plans

203131 DATA REPORT {C:\My Documents\203131 MAIN ST MIDTOWN}



CONCRETE CLASSIFICATION FOR BIDS

Strength	Max. Size of Aggregate	Max. Free Water	Max. Chloride	Max. Sulfate	Max. Air	Max. Alkali
4000	1 1/2"	20%	0.10%	0.05%	5.0%	0.10%
4500	1 1/2"	18%	0.10%	0.05%	5.0%	0.10%
5000	1 1/2"	16%	0.10%	0.05%	5.0%	0.10%
5500	1 1/2"	14%	0.10%	0.05%	5.0%	0.10%
6000	1 1/2"	12%	0.10%	0.05%	5.0%	0.10%
6500	1 1/2"	10%	0.10%	0.05%	5.0%	0.10%
7000	1 1/2"	8%	0.10%	0.05%	5.0%	0.10%
7500	1 1/2"	6%	0.10%	0.05%	5.0%	0.10%
8000	1 1/2"	4%	0.10%	0.05%	5.0%	0.10%

C-5

C-4

C-3

C-2A

C-1

18"

18"



COMBINATION	
NO.	DESCRIPTION
1	1/2" x 1/2" x 1/2"
2	1/2" x 1/2" x 1/2"
3	1/2" x 1/2" x 1/2"
4	1/2" x 1/2" x 1/2"
5	1/2" x 1/2" x 1/2"
6	1/2" x 1/2" x 1/2"
7	1/2" x 1/2" x 1/2"
8	1/2" x 1/2" x 1/2"
9	1/2" x 1/2" x 1/2"
10	1/2" x 1/2" x 1/2"

C-10



C-9



C-8



C-7

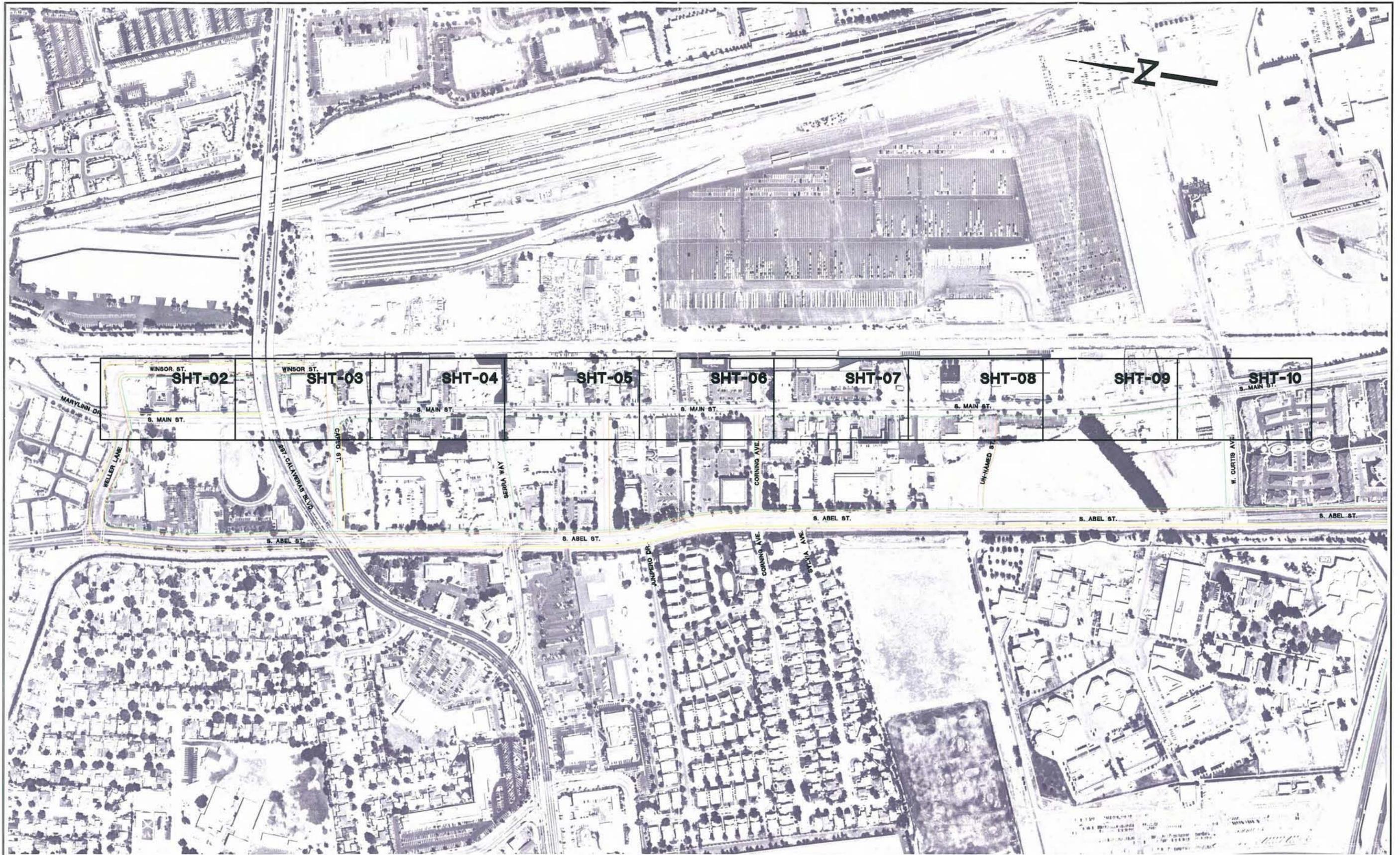
18"



C-6



12



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PLOTING VIEW: NONE					
DESIGNER: NONE PROJ. MGR: RL					

NOLTE
BEYOND ENGINEERING

1731 NORTH FIRST STREET, SUITE A, SAN JOSE, CA. 95112
408.392.7200 TEL 408.392.0111 FAX WWW.NOLTE.COM

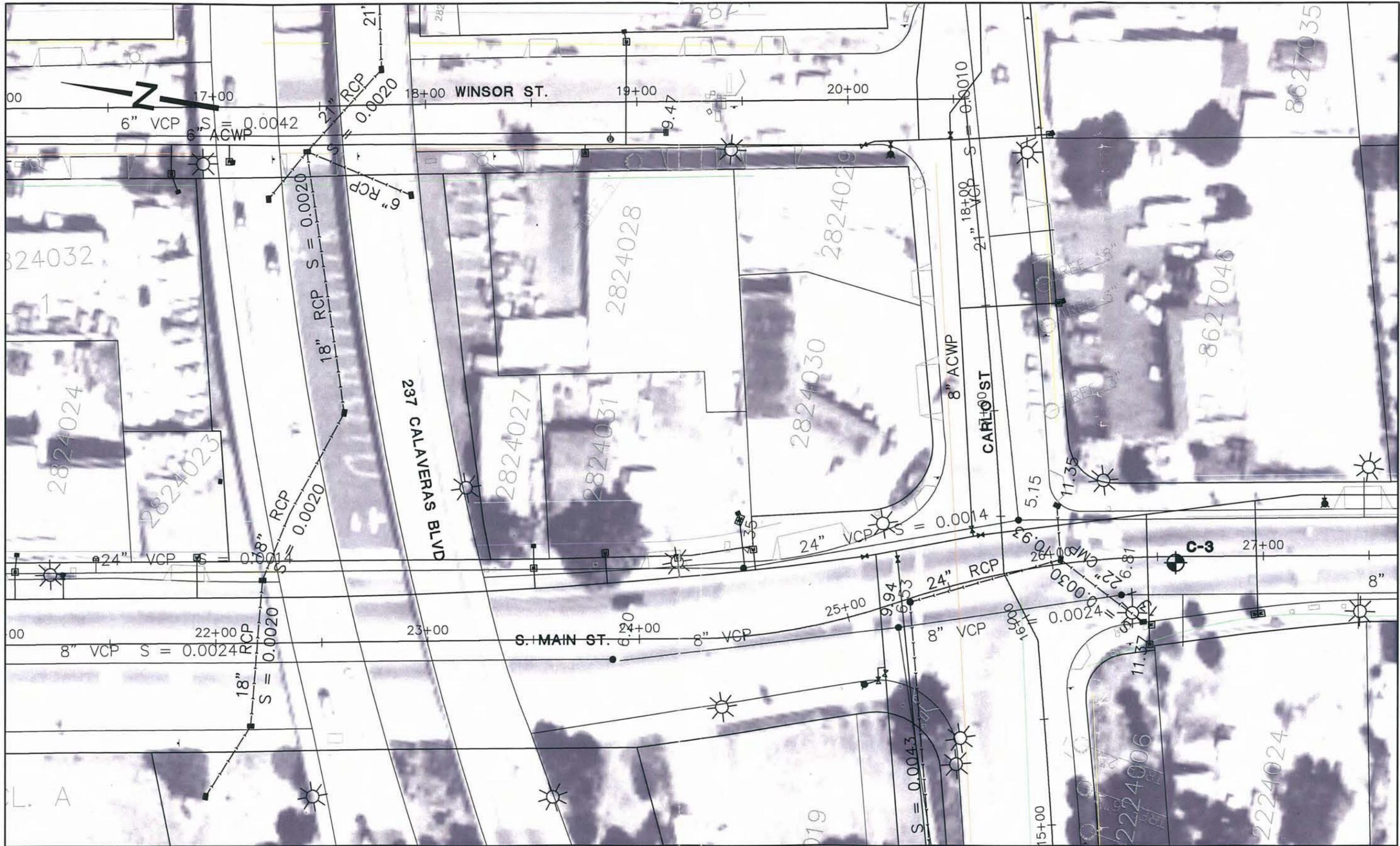
CITY OF MILPITAS
MIDTOWN MILPITAS - EXISTING CONCRETE SLAB CORE LOCATIONS
KEYMAP - MAIN STREET

PREPARED FOR:

DATE SUBMITTED:

SHEET NUMBER	1
OF	12 SHEETS
SCALE	VERTICAL: 1"= 20' HORIZONTAL: 1"= 200'
JOB NUMBER	SJ086100

CAUTION: The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes to the plans must be in writing and must be approved by the preparer of these plans.



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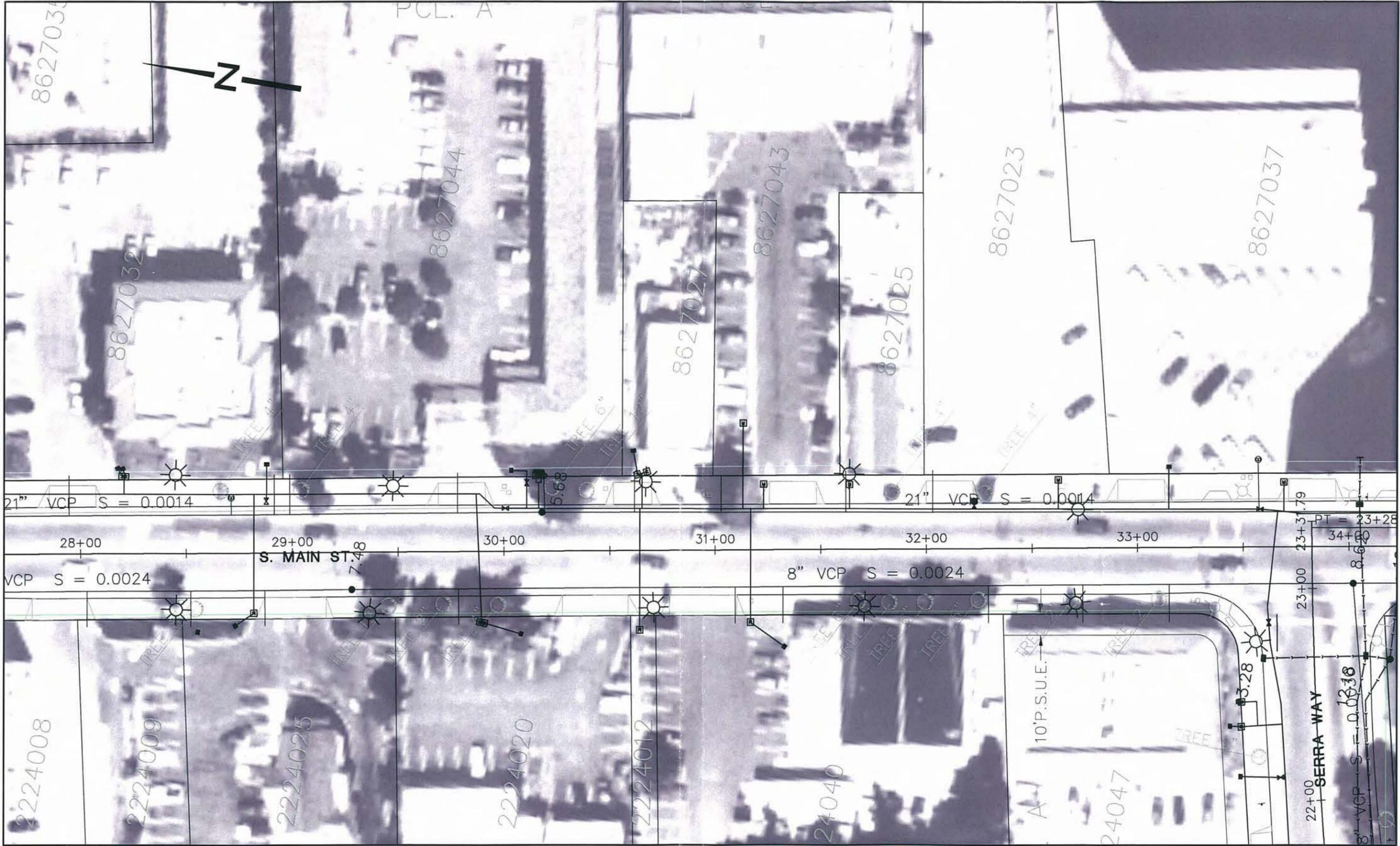
NO.	BY	DATE	REVISIONS

CAUTION: The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes to the plans must be in writing and must be approved by the preparer of these plans.

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CITY OF MILPITAS
MIDTOWN MILPITAS - EXISTING CONCRETE SLAB CORE LOCATIONS
MAIN STREET/ CARLO STREET
 PREPARED FOR: _____ DATE SUBMITTED: _____

SHEET NUMBER	3
OF	12 SHEETS
SCALE	VERTICAL: 1" = 4' HORIZONTAL: 1" = 20'
JOB NUMBER	SJ086100



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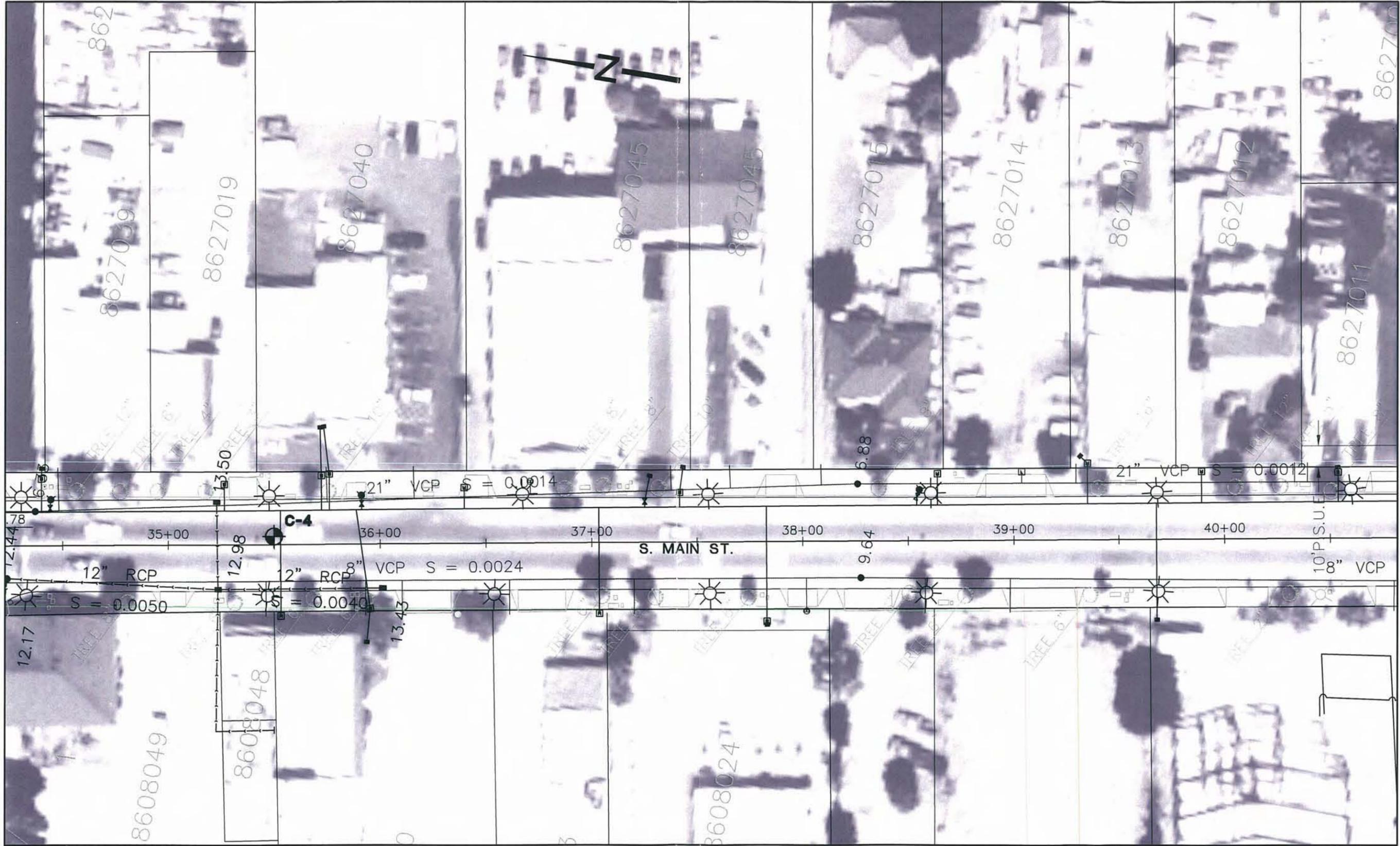
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DESIGNER: NONE	PROJ. MGR: RL				

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MIDTOWN MILPITAS - EXISTING CONCRETE SLAB CORE LOCATIONS
MAIN STREET/ SERRA WAY
 PREPARED FOR: _____ DATE SUBMITTED: _____

SHEET NUMBER	4
OF	12 SHEETS
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JOB NUMBER	SJ086100

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X:\FILES\Milpitas_Midtown_Catwalk_Midtown_Rickshill\K14_Midtown_Separ_Midtown_Slides_Midtown_Streetlight_Midtown_Water_pipes_BI-Cor

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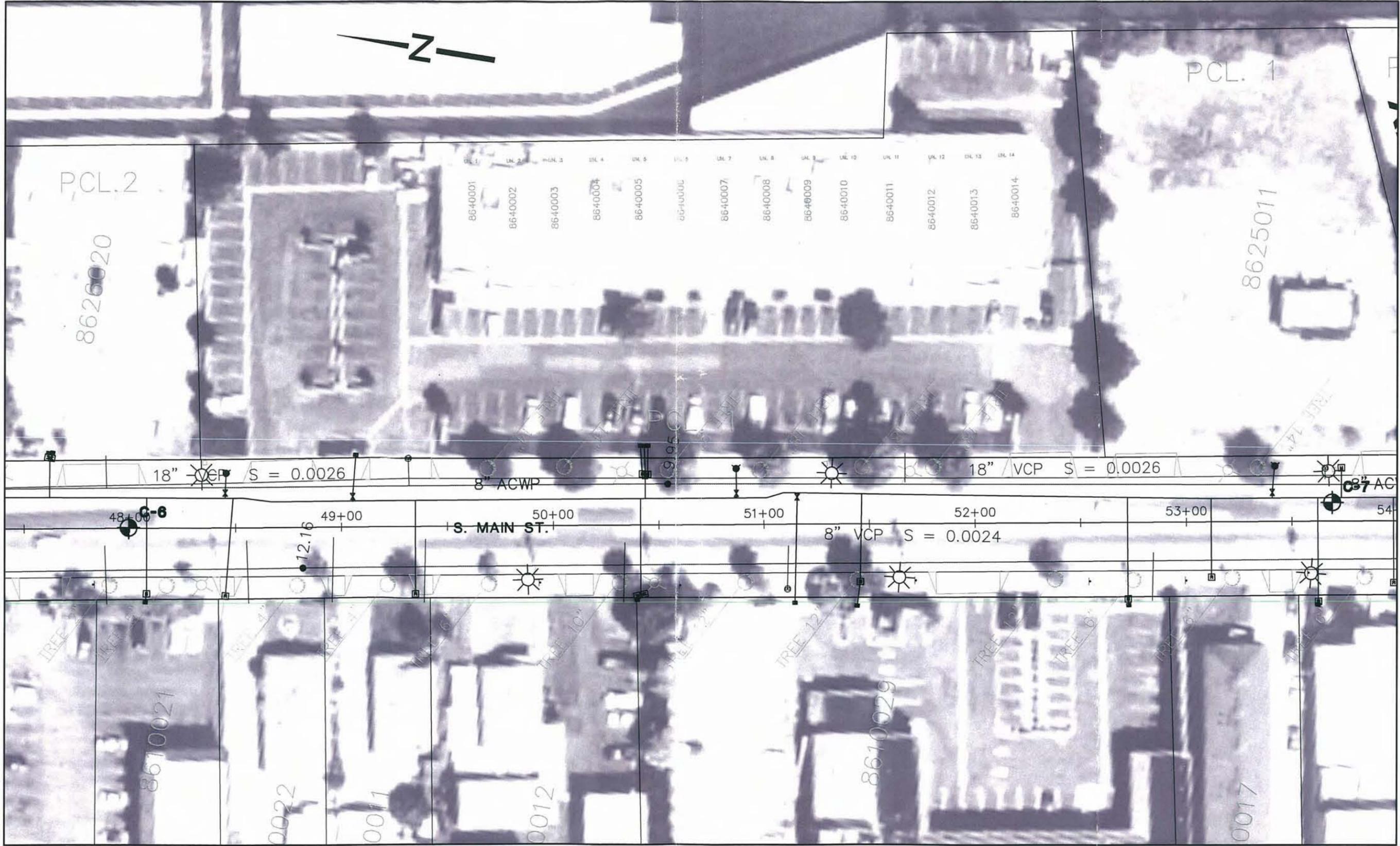


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MIDTOWN MILPITAS - EXISTING CONCRETE SLAB CORE LOCATIONS
MAIN STREET

PREPARED FOR: _____ DATE SUBMITTED: _____

SHEET NUMBER	5
OF	12 SHEETS
SCALE	VERTICAL: 1"=XX HORIZONTAL: 1"=20'
JOB NUMBER	SJ086100



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DESIGNER:	NONE	PROJ. MGR:	RL		

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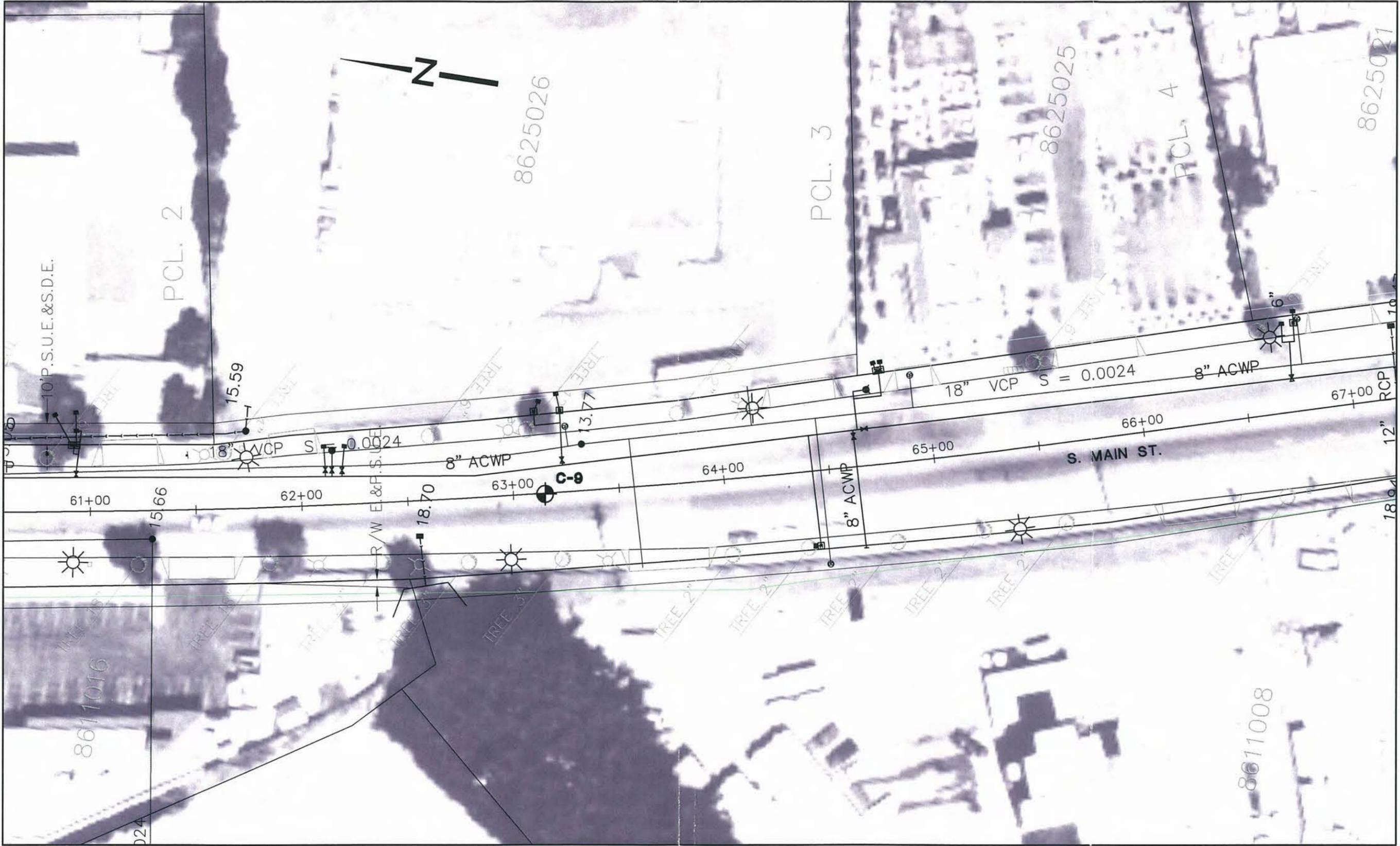
CITY OF MILPITAS
MIDTOWN MILPITAS - EXISTING CONCRETE SLAB CORE LOCATIONS
MAIN STREET

PREPARED FOR: _____

DATE SUBMITTED: _____

SHEET NUMBER	7
OF	12 SHEETS
SCALE	VERTICAL: 1" = XX' HORIZONTAL: 1" = 20'
JOB NUMBER	SJ086100

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DESIGNER: NONE PROJ. MGR: BL					

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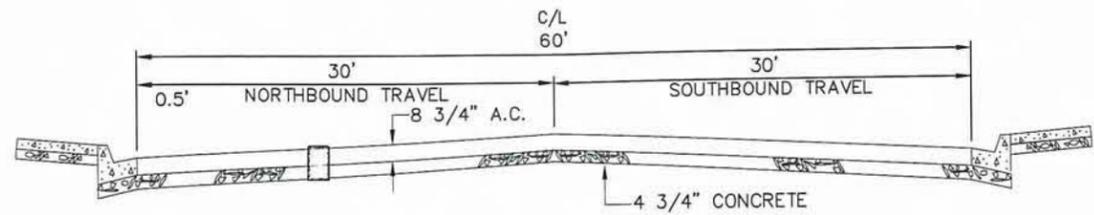
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CITY OF MILPITAS
MIDTOWN MILPITAS - EXISTING CONCRETE SLAB CORE LOCATIONS
MAIN STREET

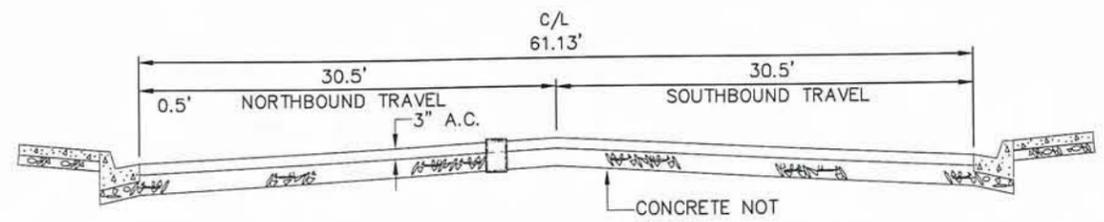
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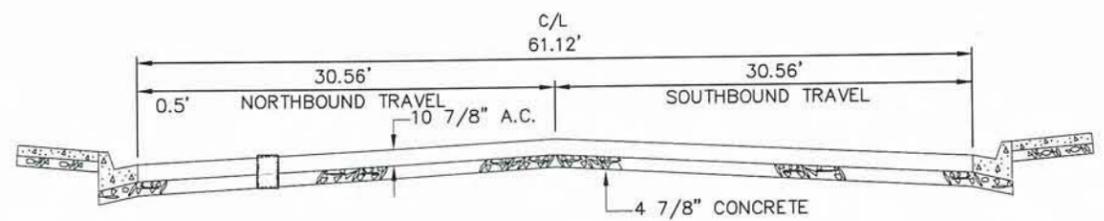
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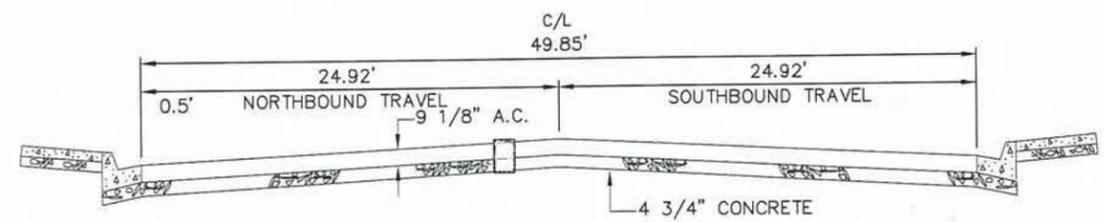
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 STA: 16+58
 TYPICAL STREET SECTION
 N.T.S.



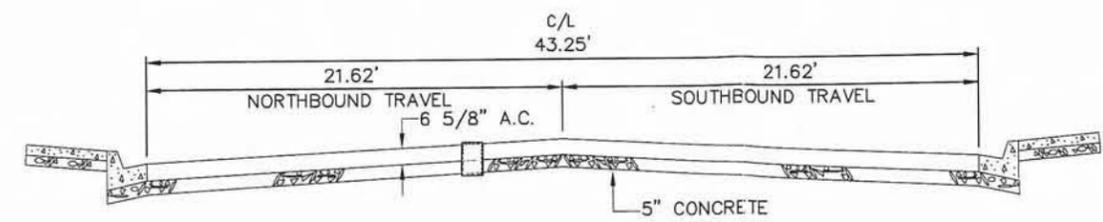
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 STA: 18+62
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 N.T.S.



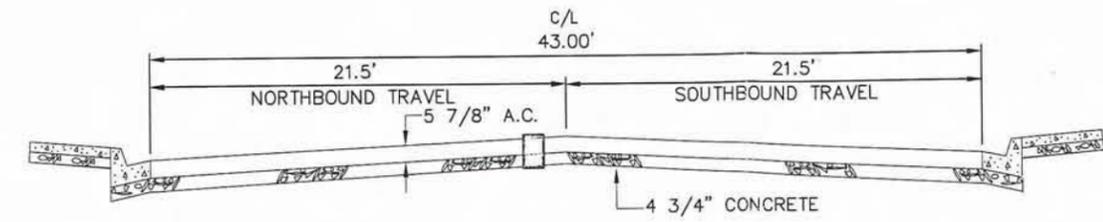
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 STA: 19+50
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 N.T.S.



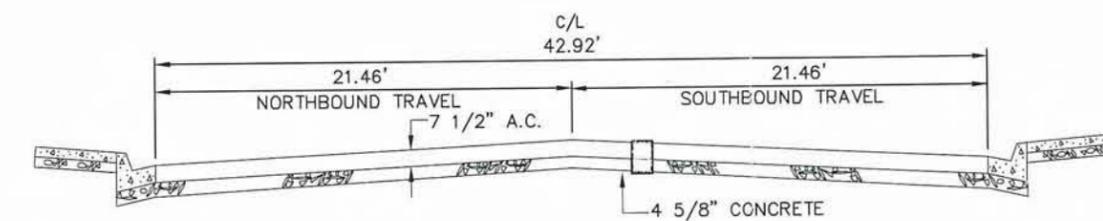
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 STA 26+50
 TYPICAL STREET SECTION
 N.T.S.



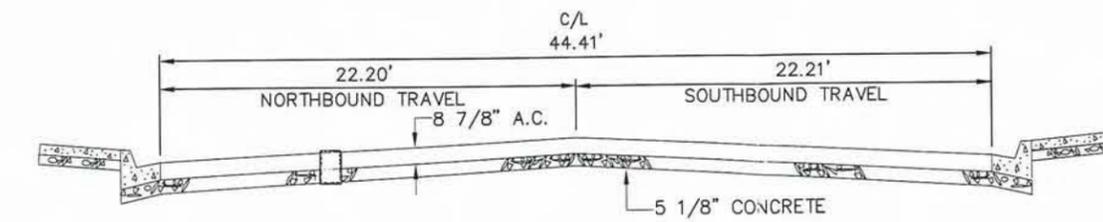
C-4
 STA: 35+50
 TYPICAL STREET SECTION
 N.T.S.



C-5
 STA: 41+50
 TYPICAL STREET SECTION
 N.T.S.



C-6
 STA: 48+00
 TYPICAL STREET SECTION
 N.T.S.



C-7
 STA 53+67
 TYPICAL STREET SECTION
 N.T.S.

□ CORE SAMPLE

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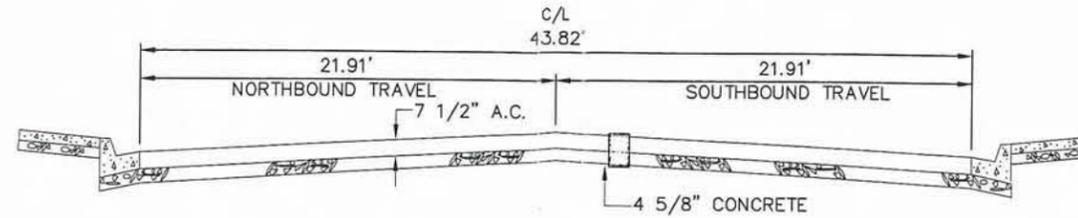
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CITY OF MILPITAS
 TYPICAL SECTIONS
 MAIN STREET EXISTING PAVEMENT

PREPARED FOR:

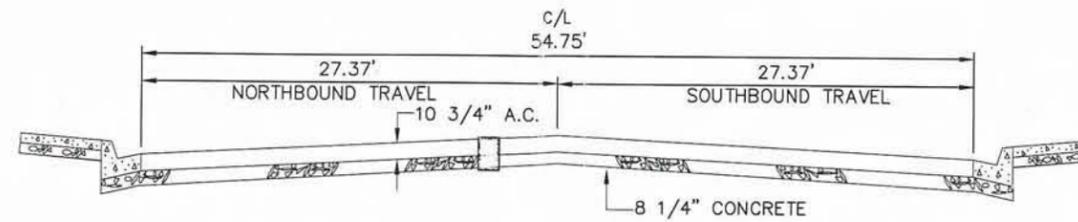
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JOB NUMBER	SJ086100



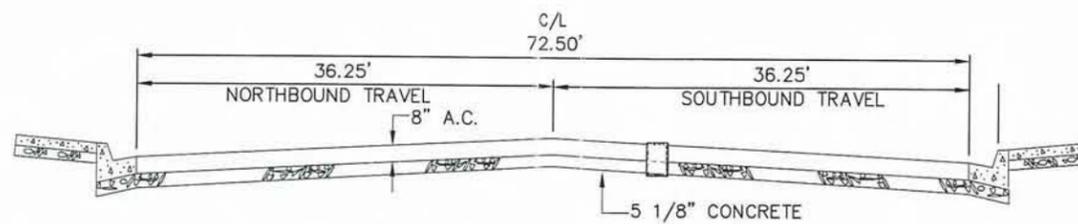
C-8

STA: 58+16
TYPICAL STREET SECTION
N.T.S.



C-9

STA: 63+09
TYPICAL STREET SECTION
N.T.S.



C-10

STA: 68+00
TYPICAL STREET SECTION
N.T.S.

□ CORE SAMPLE

DATE	TIME	NO.	BY	DATE	REVISIONS
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DRAWING NAME: X-02.DWG					
PLOTING VIEW: NONE					
DESIGNER: NONE PROJ. MGR: RL					

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408.392.7200 TEL 408.392.0101 FAX WWW.NOLTE.COM

CITY OF MILPITAS
TYPICAL SECTIONS
MAIN STREET EXISTING PAVEMENT

PREPARED FOR:

DATE SUBMITTED:

SHEET NUMBER
12
OF 12 SHEETS
SCALE
VERTICAL: 1" = XX
HORIZONTAL: 1" = 200'
JOB NUMBER
SJ086100

LETTER OF TRANSMITTAL

Parikh
356 S. Milpitas Blvd.
Milpitas, Ca 95035-5421

ATTN: Gary Parikh

REF: Ground Penetrating Radar Survey
South Main Street, Milpitas, Ca

FAX () MAIL:() PRIORITY:() EXP:() UPS: RED.(X) 2ND:() GRD:() FED.EXP:()

ENCLOSED PLEASE FIND THE FOLLOWING FOR THE ABOVE REFERENCED:

One (1) Bound Report Copy

BY: Daniel J. Bissiri

DATE: March 19, 2004



March 18, 2004

Mr. Mehdi Khaila
City of Milpitas
455 E. Calaveras Blvd.
Milpitas, CA 95035-541

**Subject: Ground Penetrating Radar Survey
South Main Street, Milpitas, CA**

Dear Mr. Khaila:

This report presents the findings of a ground penetrating radar (GPR) survey performed by NORCAL Geophysical Consultants, Inc. along South Main Street in Milpitas, California. The GPR field survey was conducted on February 28, 2004 by NORCAL geophysicist Dan Jones and technicians Travis Black and Chris Blom. Site orientation and background information were provided by, or with the assistance of, the City of Milpitas. This information included aerial photos of the survey area and a previous pavement coring report of South Main Street completed by Parikh Consultants Inc., dated October 8, 2003.

SITE DESCRIPTION AND PURPOSE

The site is located along South Main Street between Curtis Avenue to the south and Weller Lane to the north. These limits cover a distance of approximately 5500 feet as shown on the Site Map, Plate 1. The roadway is primarily asphalt-covered in this area, with concrete curbs along the west and east sides of the road. The width of the existing roadway ranges between 40 and 70 feet along this section of Main Street. It is our understanding that at one time the historic South Main Street was a narrower concrete paved roadway that was subsequently widened and paved over with asphalt. The purpose of the GPR survey is to define the lateral limits of the sub-asphalt concrete.

GENERAL METHODOLOGY

We conducted the survey using the ground penetrating radar (GPR) method. GPR is a method that provides a continuous, high resolution cross-section depicting variations in the electrical properties of the shallow subsurface. The system operates by continuously radiating an electromagnetic pulse into the ground from an antenna as it is moved along a traverse. Since most earth materials are partially transparent to electromagnetic energy, only a portion of the radar signal is reflected back to the surface. When the radar signal encounters an interface representing a change in electrical properties, such as the case between asphalt and concrete or other base materials, some of the electromagnetic energy is reflected back to the surface. When the signal encounters a metal object, such as a utility or buried metallic debris, virtually all of the incident energy is reflected. All reflected signals are received by the same antenna and are printed in cross-section form (time-depth) on a graphical recorder and saved to the hard drive of the control console. The resulting records show an electronic "image" representing the shallow subsurface characteristics and buried features.



City of Milpitas
March 18, 2004
Job No. 04-752.01
Page 2

This image is dependent upon the depth of subsurface sources, the electrical conductivity and dielectric permittivity of the subsurface materials, and the contrast in electrical properties of specific objects within the zone of detection. Given the shallow subsurface conditions within the South Main Street roadway, it was assumed that there would be a difference in electrical properties between the asphalt, former concrete roadway, and road base materials.

We used a Geophysical Survey Systems, Inc. SIR-2000 Subsurface Interface Radar System equipped with either a 500 or 900 megahertz (MHz) antenna. Generally, these antennae can be used to provide high resolution from the ground surface to depths of approximately 3 to 4 feet. The actual depth of investigation can vary with different locales and is dependent upon the electrical and magnetic properties of the subsurface. The anticipated depth to the base of the concrete based on coring data was less than 1.5 feet.

DATA ACQUISITION

The field survey coverage consisted of 30 GPR profiles designated GPR-1 through GPR-30, numbered sequentially from south to north. These traverses were oriented approximately perpendicular to the roadway and were spaced from 105 to 250 feet apart. We used measuring tapes and spray paint to mark out five foot intervals along each traverse for horizontal control and label each profile. We conducted each traverse from the west curb to the east curb. The starting and ending position of each traverse were surveyed with a Trimble Pro-XR global positioning system. Ten of the 30 traverses were conducted over, or adjacent to, previous core locations (C-2 through C-10) that were performed by Parikh Consultants, Inc.

DATA ANALYSIS

The first step in the data analysis procedure was to examine the GPR records that corresponded with the core locations and therefore the known concrete locations and pavement thicknesses. On these records, we typically observed noticeable changes in the reflection characteristics of the flat, near-surface layering that we correlated with the presence of concrete. These changes included alterations in both the amplitude and breadth of the horizontal reflections in the upper 1.5 feet. We then used these distinguishing reflection characteristics of the concrete from the documented locations as a criteria for interpreting the limits of the concrete on all profiles. During our analysis, we noticed variability in the reflection quality of the concrete from traverses to traverse, presumably due to changes in asphalt thickness as well as changes in the sand slurry seal and leveling course between the old concrete pavement and the asphalt overlay. There was also variability in the definition of the boundary of the concrete as manifested on the GPR records. In our review of the profiles, we also observed reflections beneath the pavement at depths greater than 1.5 feet, indicative of other subsurface features. These reflections include localized high amplitude, "ringing" reflections typical



City of Milpitas
March 18, 2004
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of underground utilities, and broad changes in amplitude over a significant distance that indicate a change in subsurface materials such as a change in fill or soil type, water content, etc.

Two sample GPR profiles representing traverses GPR-1 (upper figure) and GPR-20 (lower figure) are presented on Plate 2. These profiles present a cross sectional view of changes in the subsurface along each traverse. The horizontal axis represents distance along the traverse as measured from the west curb face. The vertical axis is measured in recording time and is converted to approximate depth in feet. Based on our established criteria discussed above, the lateral limits of the interpreted sub-asphalt concrete are labeled on both profiles. On GPR-1, this zone extends from 26 to 46 feet; on GPR-20 it extends from 14 to 32 feet. These example profiles also serve to highlight the other detected features beneath the pavement. This includes the "ringing" reflections along GPR-20 near 23 and 33 feet that are typical of utilities. It also includes three different types of reflection characteristics beneath the asphalt and concrete pavements along GPR-1. From 0 to 26 feet along the profile, and at depths greater than 1.5 feet, we observe high amplitude reflections typical of changes in material properties such as soil type or degree of saturation. From 26 to 45 feet, lower amplitude, but discontinuous reflections are apparent and may indicate disturbed conditions presumably from previous construction. From 45 feet to the end of the line, continuous horizontal reflections are indicative of more homogeneous and/or undisturbed material conditions.

RESULTS

The original site map was provided by the City of Milpitas. It included the existing roadway edges (curbs) of the South Main Street and the core locations from the Parikh Consultants report for reference. We have overlain the final results of the GPR survey interpretation on this site map, Plate 1. The results include the locations of the GPR traverses and the interpreted location of the former concrete roadway shown with grey shading along each traverse. In general, a review of this map indicates that the former concrete roadway is approximately centered along the current S. Main Street roadway from Curtis Avenue northward until the East Calaveras Boulevard overpass. It then appears to trend along the east half of Main Street from the overpass to Weller Lane.

Table 1 (below) presents a more detailed summary of the interpreted lateral limits of the concrete, the existing road width, the locations of utility-type GPR reflections, and the GPS survey information. The limits of the old concrete pavement, the locations of the utility-type reflections, and the existing road widths are provided in feet as distances measured from the western curb face. The GPS coordinates are provided in California State Planar coordinate system Zone 3, NAD 1983, US Survey Feet. The start point of each traverse was at the west curb and the endpoint was at the east curb. We show that the concrete is between 16.5 and 20 feet wide along our traverses with the exception of GPR-24 where it appears to be 29 feet wide. It should be noted that on traverses GPR-24, -25, and -26 the sub-asphalt concrete edge was poorly defined (indicated by question marks in Table 1).



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Table 1 - Results of GPR Survey

GPR Line	Current Road Width*	Limits of Concrete* (feet)	Location of Utility-Type Reflections*	Start Point** (west) Northing/Easting	End Point** (east) Northing/Easting
GPR-1	0 - 70	26 - 46		1978102.6/6154002.0	1978126.1/6154068.2
GPR-2	0 - 69	26 - 43.5		1978224.5/6153962.8	1978247.3/6154028.3
GPR-3	0 - 69	26 - 44	24	1978387.7/6153909.9	1978409.4/6153976.9
GPR-4	0 - 62	22.5 - 40	22	1978545.5/6153867.4	1978562.4/6153926.9
GPR-5	0 - 50	16 - 34	15	1978675.7/6153840.8	1978688.3/6153890.5
GPR-6	0 - 43.5	11 - 28.5	12	1978821.4/6153814.4	1978833.0/6153859.1
GPR-7	0 - 42	11.5 - 28.5	11.5	1978978.9/6153786.7	1978985.3/6153829.3
GPR-8	0 - 43	11.5 - 29	11,28	1979114.4/6153759.7	1979121.1/6153800.0
GPR-9	0 - 44	12 - 30	10.5	1979256.6/6153736.1	1979265.5/6153775.1
GPR-10	0 - 44	12.5 - 28		1979409.2/6153704.1	1979414.7/6153747.8
GPR-11	0 - 44	12.5 - 31	11	1979570.2/6153674.5	1979581.7/6153717.4
GPR-12	0 - 45	13.5 - 31.5	12.5	1979758.6/6153639.4	1979762.7/6153681.9
GPR-13	0 - 45	11 - 29		1979930.9/6153608.4	1979941.9/6153652.2
GPR-14	0 - 45	14 - 31.5		1980116.3/6153572.8	1980124.3/6153619.5
GPR-15	0 - 45	14 - 31	13.5, 36	1980316.9/6153535.8	1980324.1/6153578.4
GPR-16	0 - 45	14.5 - 27.5		1980519.4/6153500.2	1980525.7/6153546.1
GPR-17	0 - 45	14 - 32	4, 12.5	1980755.4/6153458.6	1980760.6/6153500.0
GPR-18	0 - 43	14.5 - 32		1980935.3/6153425.0	1980941.6/6153465.0
GPR-19	0 - 43	13.5 - 33		1981154.9/6153384.0	1981161.0/6153426.3
GPR-20	0 - 43	14 - 32	22.5, 33	1981349.7/6153351.4	1981360.2/6153388.2
GPR-21	0 - 40	14 - 33	9, 13.5, 38.5	1981595.7/615330.4	1981603.3/6153345.5



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GPR-22	0 - 40	13.5 - 31	5, 21, 39	1981818.7/6153262.8	1981826.9/6153305.1
GPR-23	0 - 40	13.5 - 31.5	5, 8, 22, 40	1982050.6/6153222.0	1982054.5/6153260.6
GPR-24	0 - 47	14 - 43?	37	1982201.5/6153184.2	1982211.1/6153231.0
GPR-25	0 - 64	21? - 43.5	1, 61	1982401.3/6153111.0	1982419.7/6153172.8
GPR-26	0 - 70	39? - 58	2.5, 66	1982601.1/6153061.2	1982612.4/6153128.8
GPR-27	0 - 70	39 - 57	10	1982787.2/6153026.9	1982795.4/6153095.8
GPR-28	0 - 60	32 - 50	21	1982892.5/6153016.6	1982899.8/6153076.6
GPR-29	0 - 60	30 - 47		1983053.1/6152987.2	1983061.6/6153047.3
GPR-30	0 - 60	28 - 46.5	22, 48.5	1983216.9/6152957.7	1983227.1/6153016.8

*distances in feet referenced from western curb face of S. Main Street

**California State Plane Coordinate System Zone 3, NAD 1983, US Survey Feet, Points at West or East Curb Face

ADDITIONAL DISCUSSION AND LIMITATIONS

As listed in Table 1 above, we observed utility-type reflections on 16 out of 30 of the profiles. In many cases, the utility-type reflections were observed very near the interpreted concrete edge. For example, on GPR-3 a utility-type reflection is located at 24 feet and the western concrete limit was determined to be 26 feet. This could indicate that a utility trench was dug adjacent to the concrete edge or may have interrupted the original concrete edge. Due to the locations of utilities, changes in asphalt thickness, and possibly changes in the sand slurry seal and leveling course between the old concrete pavement and the asphalt overlay we observed variability in the definition of the concrete edge from traverse to traverse. In many locations it was very easily defined, whereas in others, the exact edge was more difficult to discern.

Additionally, we were unable to determine the exact thickness of the concrete and asphalt layers with reliable accuracy, due to the limited thickness of the concrete, multiple asphalt layers, and other survey factors. However, it should be noted that as reported in the Parikh Consultants coring report, the thickness was rather consistent, ranging from 4 3/4 to 5 1/8 inches for all cores except C-9, where it was 8 1/4 inches.



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STANDARD CARE AND WARRANTY

The scope of NORCAL's services for this project consisted of using geophysical techniques to characterize the shallow subsurface. The accuracy of our findings is subject to specific site conditions and limitations inherent to the techniques used. We performed our services in a manner consistent with the standard of care exercised by members of the profession currently employing similar techniques. No warranty, with respect to the performance of services or products delivered under this agreement, expressed or implied, is made by NORCAL.

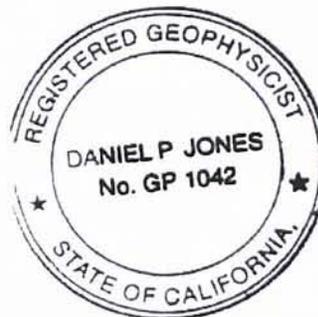
We appreciate having the opportunity to provide you with this information.

Respectfully,

NORCAL Geophysical Consultants, Inc.

A handwritten signature in black ink, appearing to read "Dan P. Jones".

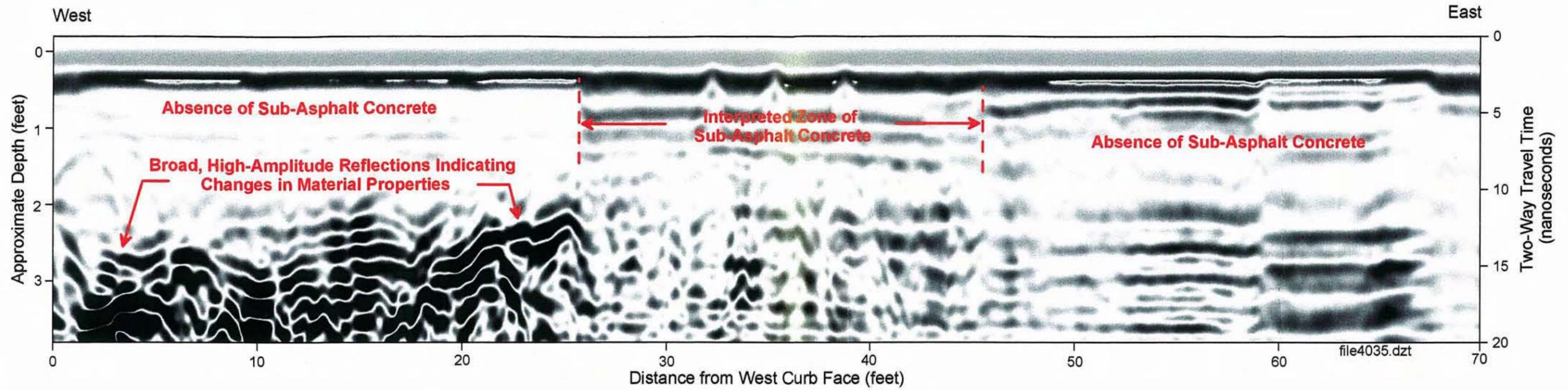
Dan P. Jones
Geophysicist, RGP 1042



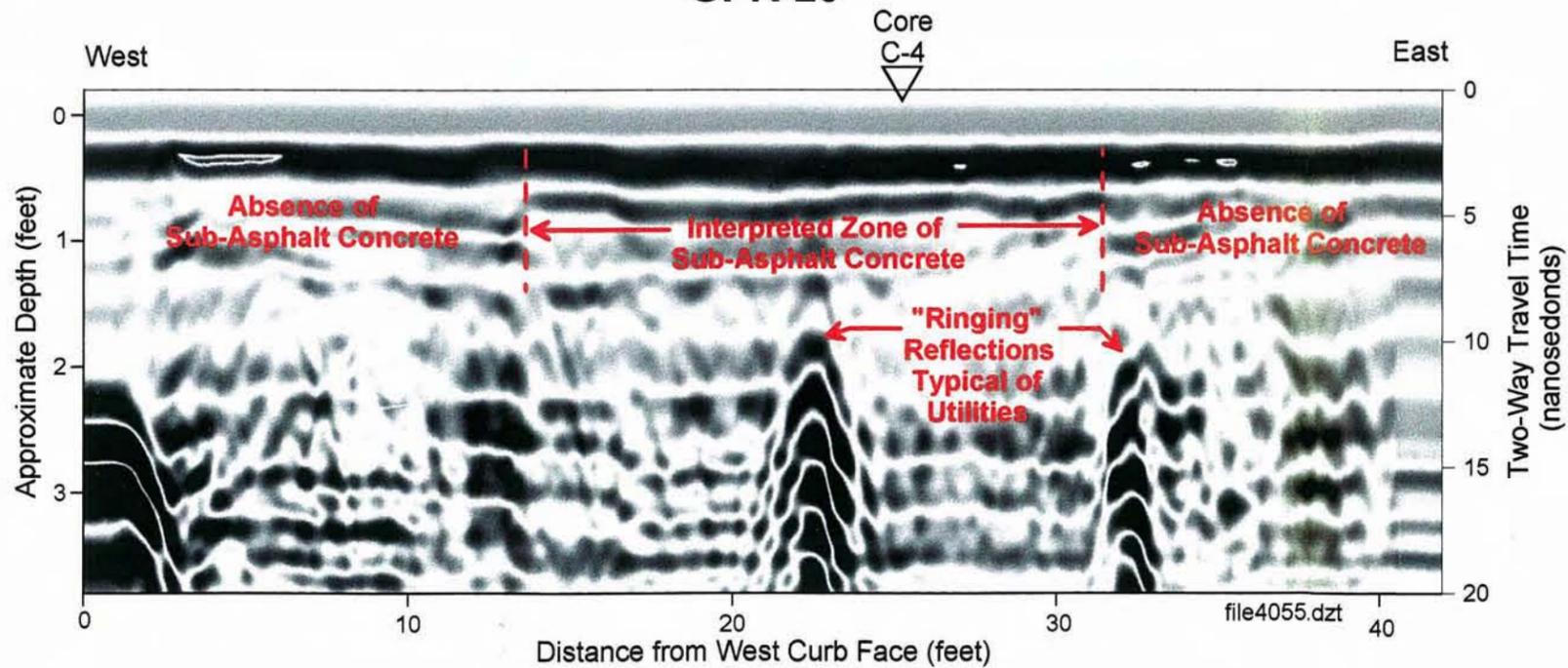
Enclosure: Plate 1 - Site Map
Plate 2 - Example GPR Profiles
AutoCAD CD with digital copy of survey map

cc: Mr. Gary Parikh (Parikh Consultants, Inc.)

GPR-1



GPR-20



NOTE: VERTICAL EXAGGERATION USED FOR DISPLAY

 NORCAL	Example GPR Profiles South Main Street		PLATE 2
	LOCATION: MILPITAS, CA		
	CLIENT: CITY OF MILPITAS		
	NORCAL GEOPHYSICAL CONSULTANTS INC.		
JOB #: 04-752.01	DATE: MARCH 2004	DRAWN BY: DPJ	APPROVED BY: KGB

