Thornton Water Project
Larimer County
1041 Permit Application
Supplemental Additional Information

Submitted to:
Larimer County Planning Department
200 West Oak Street, Suite 3100
Fort Collins, CO 80521

Date: April 2, 2018

Prepared By:
CH2M HILL
9191 South Jamaica Street
Englewood, CO 80112

Prepared For:
City of Thornton
9500 Civic Center Drive
Thornton, CO 80229

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Thornton Water Project Acronyms and Abbreviations

Supplemental Additional Information

Application	TWP 1041 permit application
CAD	Computer-aided Design
CDOT	Colorado Department of Transportation
CPW	Colorado Parks and Wildlife
LUC	Larimer County Land Use Code
PVREA	Poudre Valley Rural Electrical Association
Thornton	City of Thornton
TWP	Thornton Water Project
WSSC	Water Supply and Storage Company

Drawings

BUR	Buried
CIR	Circle
CL	Centerline
CMP	Corrugated Metal Pipe
CPP	Crumpler Plastic Pipe
CT	Court
CV	Cove
DR	Drive
FO	Fiber Optic
INV	Invert
DR	Drive
EL	Easement Line
ELCO	East Larimer County
EOP	Edge of Pavement
E-OVH	Electric Overhead
EXST	Existing
GMA	Growth Management Area
GS	Gas
HWY	Highway
LN	Lane
MKR	Marker
N	North
NO.	Number
PN	Parcel Number
PKW	Parkway
PUD	Planned Unit Development
RCP	Reinforced Concrete Pipe
REC	Recorded
ROW or R/W	Right-of-Way
S	South
T	Telephone
TYP	Typical
VFD	Variable Frequency Drive
W	Water

Introduction

The city of Thornton (Thornton), Colorado is requesting a 1041 permit for the Thornton Water Project (TWP), the siting and development of which has been designated as an area and activity of state interest as authorized by Title 24, Section 65.1-501 of the Colorado Revised Statutes, and Sections 12 and 14 of Part II of the Larimer County Land Use Code (LUC), Version September 13, 2017. The matter of state interest, as defined by the LUC, involves the siting and development of a new domestic water transmission line that is contained within new permanent easements greater than 30 feet.

Thornton submitted the TWP 1041 permit application (Application) on January 5, 2018. After that submission, the Larimer County Community Development Division Director, by letter dated January 26, 2018, a copy of which follows this introduction, requested that Thornton provide additional information/materials to evaluate the Application. In accordance with Larimer County's request, information included in this submission pertains to the portion of the TWP corridor that was presented in the Application along Douglas Road from approximately Bayshore Road to Turnberry Road (approximately 2.6 miles). Additional information on the source water pump station is also included. Unless otherwise noted, information provided in this supplemental submission is in addition to information that was previously provided. It is not intended to replace previously submitted Application material.

LARIMER COUNTY | COMMUNITY DEVELOPMENT DIVISION

Director's Office, P.O. Box 1190, Fort Collins, Colorado 80522-1190, 970.498.7690, Larimer.org

Date: 26 January 2018

TO: Mark Koleber
Thornton Water Project Director
City of Thornton
12450 Washington St.
Thornton, Colorado 80241-2405

RE: Thornton Water Project – 18-Zone2305

The Planning Commission Public Hearing for 21 February 2018 and the Board of County Commissioners' Public Hearing for 26 March 2018 have been canceled.

In accordance with Larimer County Land Use Code, section 14.9.C.1.b. (1041 Permit Application And Review Process), the Larimer County Community Development Division Director has determined additional information/materials are required, from the City of Thornton, in order to complete the review of the Thornton Pipeline application.

When the County receives the requested information/materials, staff will review the information/materials for completeness. Once the information/materials are deemed complete, the City of Thornton will be notified and a new set of public hearings will be scheduled.

Additional technical information is necessary to allow Larimer County to adequately evaluate the permit application along the 2.6 mile segment of Douglas Road (County Road 54) as further described below.

1. **Field Survey Information:**
   Collect and provide the following information within the existing right-of-way limits.
   a. Property lines adjacent to the existing right-of-way.
   b. Topographic and elevation data
   c. Surface features within the existing right-of-way boundaries
   d. Center line and edge of existing pavement
   e. Utility locations of existing overhead and underground utilities
   f. Locations and elevations of existing culverts and irrigation crossings
   g. CAD files of said information provided to Engineering Department for review.

   The County will provide CAD file of existing ROW limits. Applicant's surveyor shall use survey control that has been established by the County Engineering Department.

2. **Pipe Alignment**:
   Provide sufficient alignment information to allow County to evaluate pipeline alignment location.

LARIMER COUNTY

a. Engineering drawing depicting the preferred horizontal pipeline alignment.
b. Engineering drawing showing the estimated extent of work area necessary for installation of pipeline along horizontal alignment.
c. Drawing depicting the minimum permit corridor width along the 2.6 mile segment.
d. A description of mitigation measures, if the corridor width is greater than 100 feet centered along the centerline of the existing pavement of Douglas Road.

3. **Anticipated Construction Schedule:**
Provide an estimated construction schedule identifying the anticipated construction year and season for each of the following segments.
   a. Pipeline segment located west of State Highway 1.
   b. Pipeline segment located between State Highway 1 and CR 11 (Turnberry Road).
   c. Pipeline segment crossing State Highway 1, given the anticipated traffic signal installation.

4. **Pavement Restoration Plan**
Provide a pavement restoration plan identifying proposed limits and method of repair. In general, the proposed method shall comply with criteria outlined in Chapter 12 of the Larimer County *Rural Area Road Standards, Right of Way Permitting and Construction Standards for Facilities Located in Public Right of Way*. Existing pavement must be restored to a condition equivalent to pre-project conditions. A final pavement surface with extensive patching will not be considered equivalent to pre-project conditions.

5. **Utility Coordination**
A summary of how the applicant will coordinate and provide for all utility relocation to allow for installation of the pipeline.

Additionally, the County needs the following information regarding the pump station:

1. Parcel number.
2. Location of the pump station, on the parcel.
3. General configuration of the building.
4. Basic information, concern of the equipment operating in the building; type, output, etc.

Should you have any questions, please contact Rob Helmick
Phone: 970-498-7682
Email: rhelmick@Larimer.Org

Sincerely,

Robert Terry Gilbert

COL Robert "Terry" Gilbert (ret.), AICP
Director

Supplement 1 Field Survey Information

This section addresses Larimer County's request for field survey information.

Survey along Douglas Road from approximately Bayshore Road to Turnberry Road was conducted in late January/early February 2018. Existing right-of-way limits and LIDAR information were provided to Thornton by Larimer County. Survey control was established by Larimer County Engineering Department. See **Drawings S1-1** through **S1-6** and computer-aided design (CAD) files. Survey information provided includes the following information:

1.a Property lines adjacent to the existing right-of-way.

1.b Topographic and elevation data.

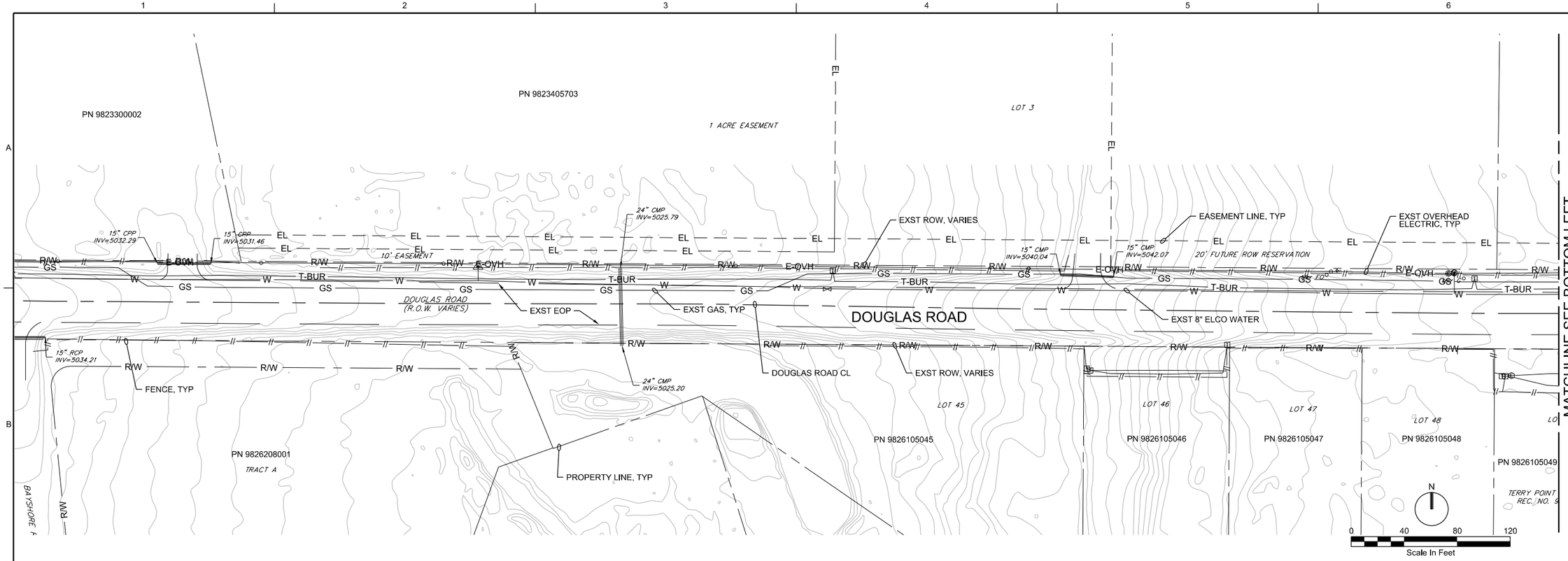
1.c Surface features within the existing right-of-way boundaries.

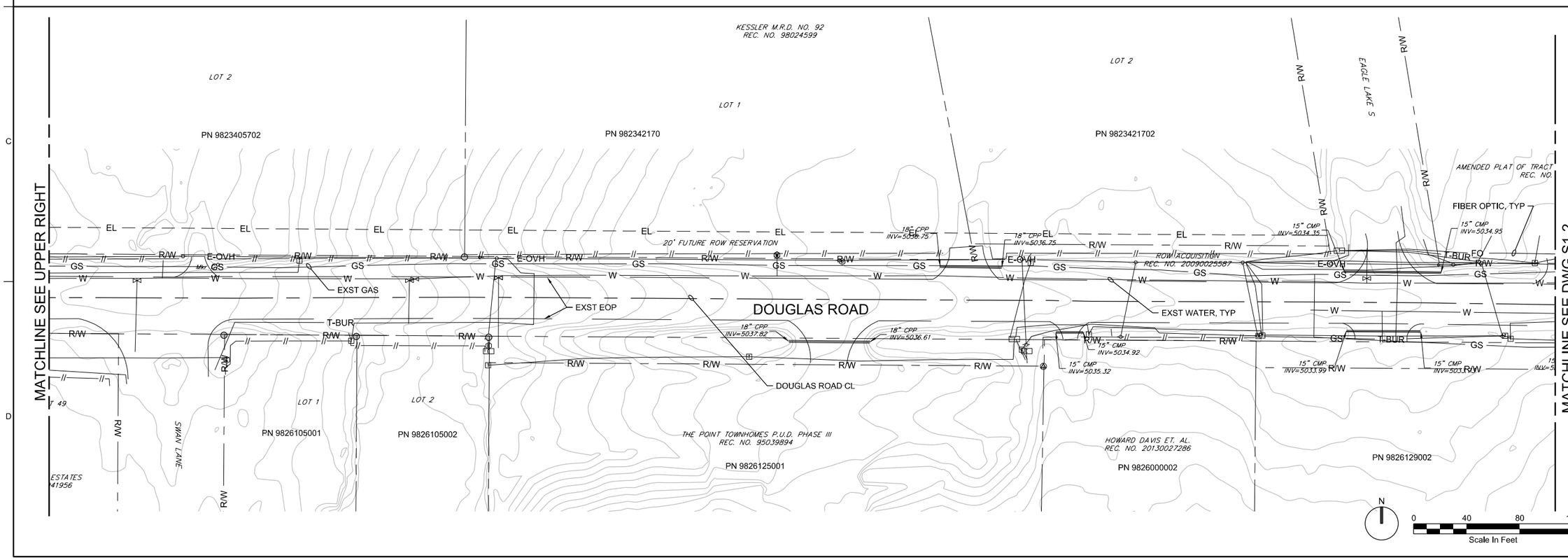
1.d Center line and edge of existing pavement.

1.e Utility locations of existing overhead and underground utilities.

1.f Locations and elevations of existing culverts and irrigation crossings.

1.g CAD files of said information provided to Engineering Department for review.





NO.	DATE	REVISION	BY	APVD

DSGN	DR	CHK	APVD
T STOUT	M MONAHAN	T STOUT	T STOUT

THORNTON WATER PROJECT
CITY OF THORNTON
THORNTON, CO

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DRAWING S1-1
FIELD SURVEY INFORMATION

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
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PROJ	000181
DWG	S1-1
SHEET	of

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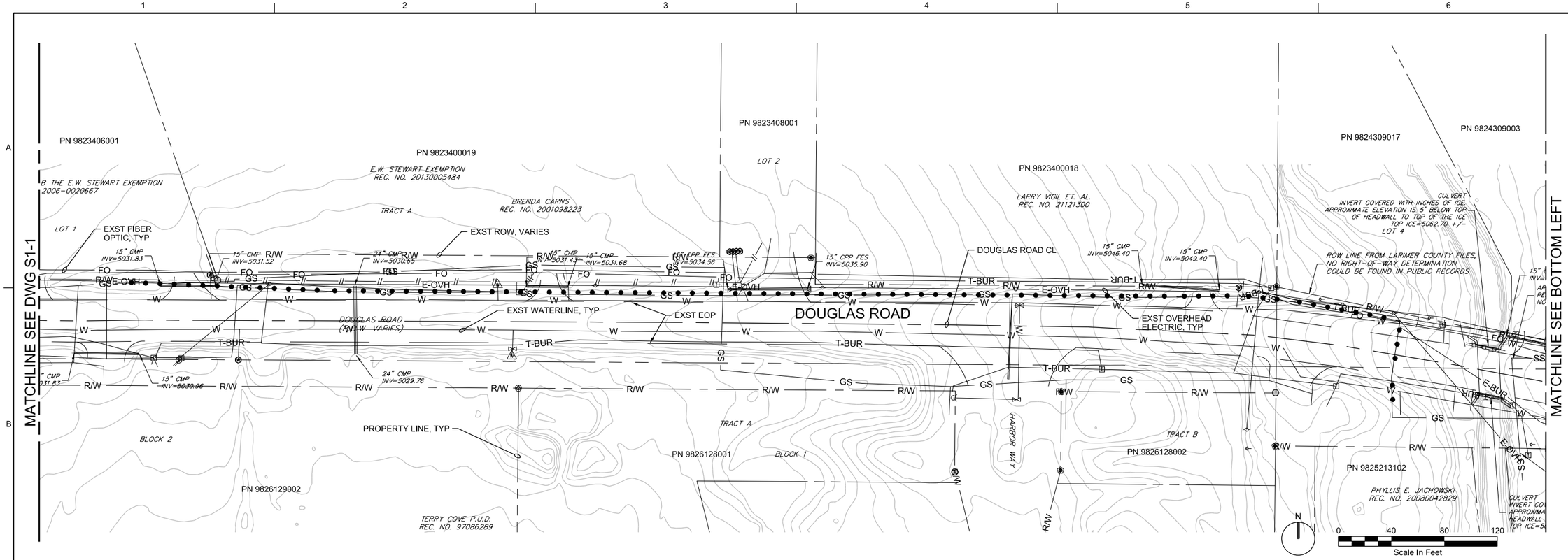

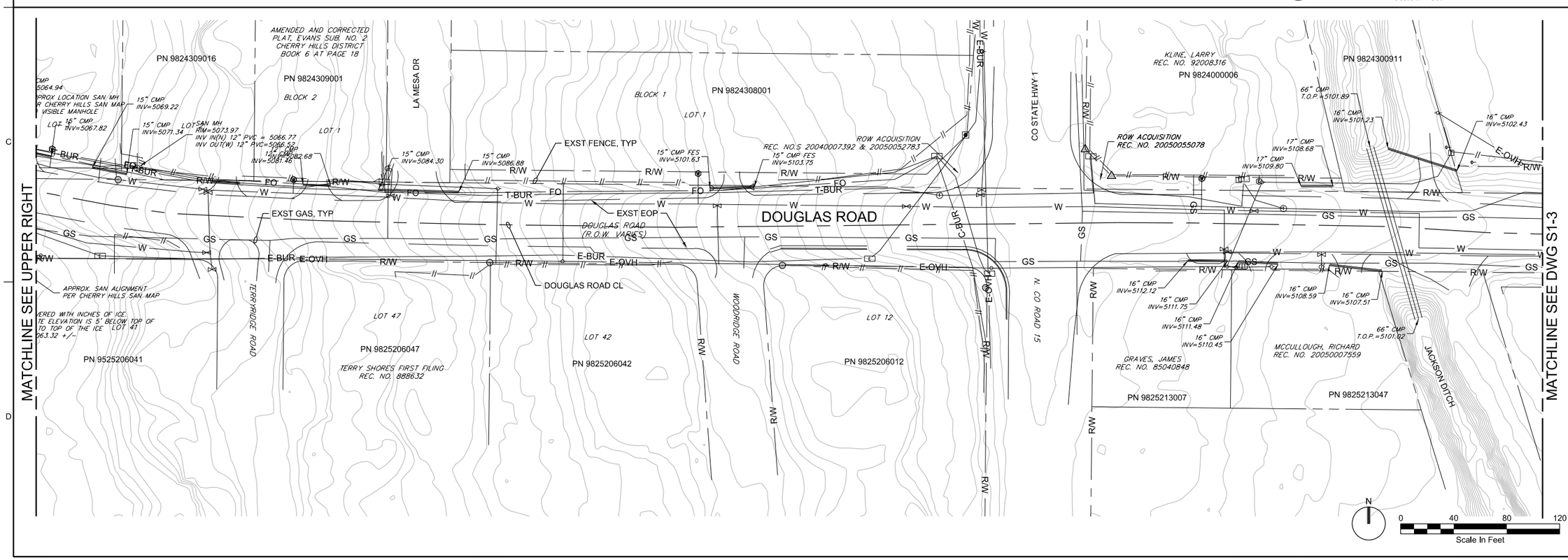

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DRAWING S1-2
FIELD SURVEY INFORMATION

CONCEPTUAL-NOT FOR CONSTRUCTION

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SHEET	of

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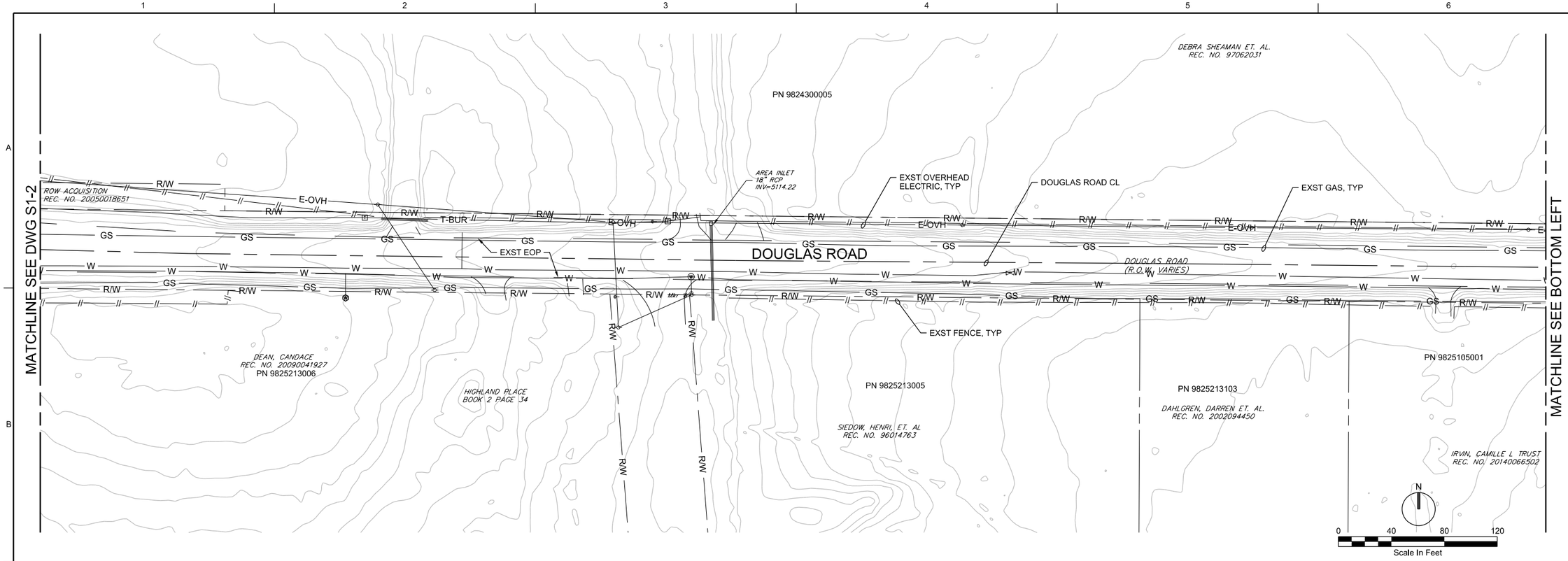

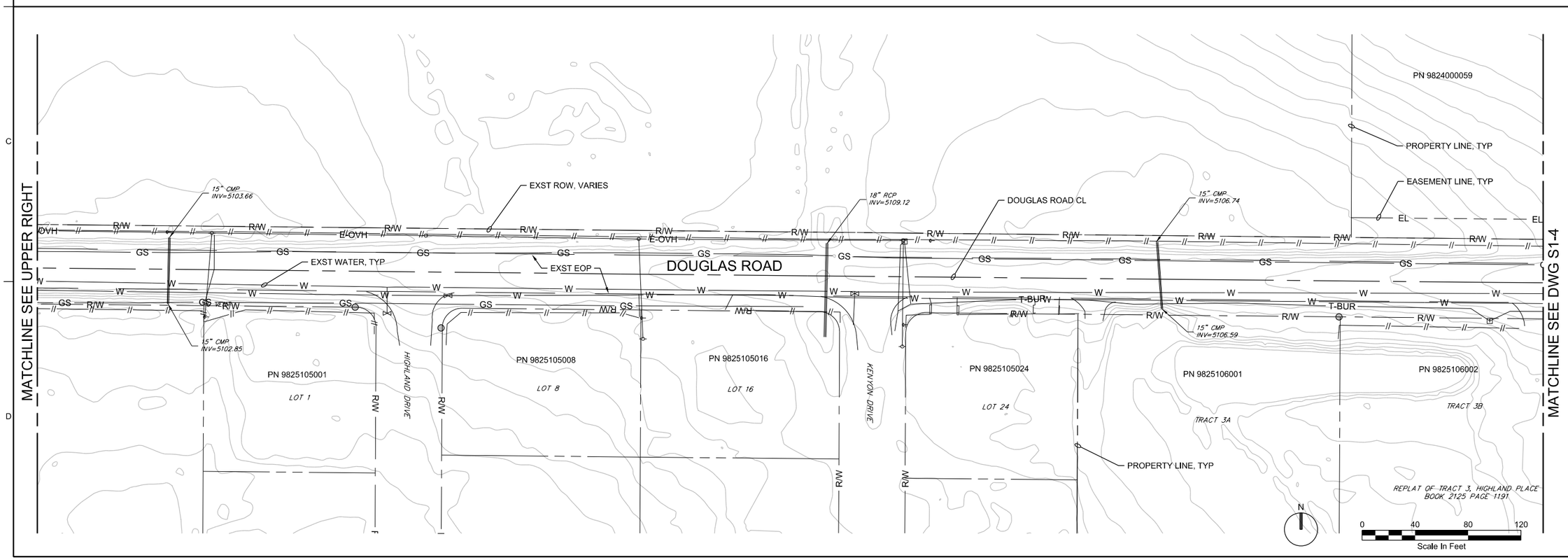

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DRAWING S1-3
FIELD SURVEY INFORMATION

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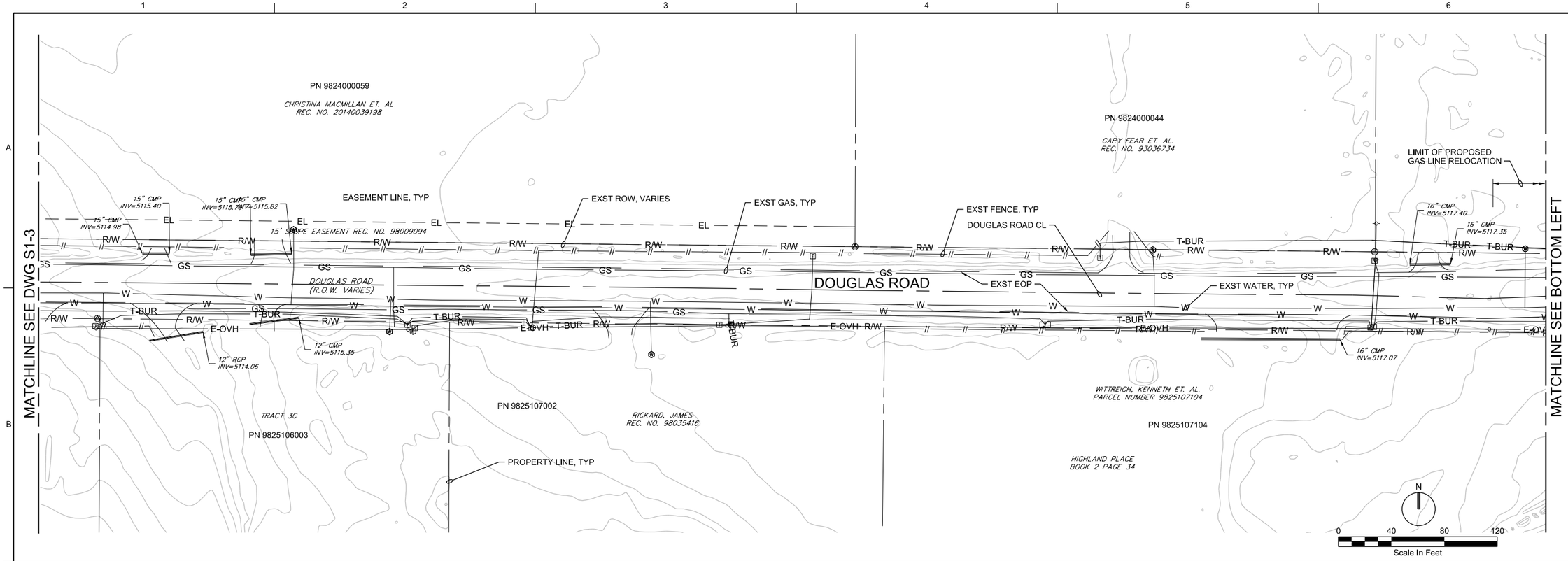

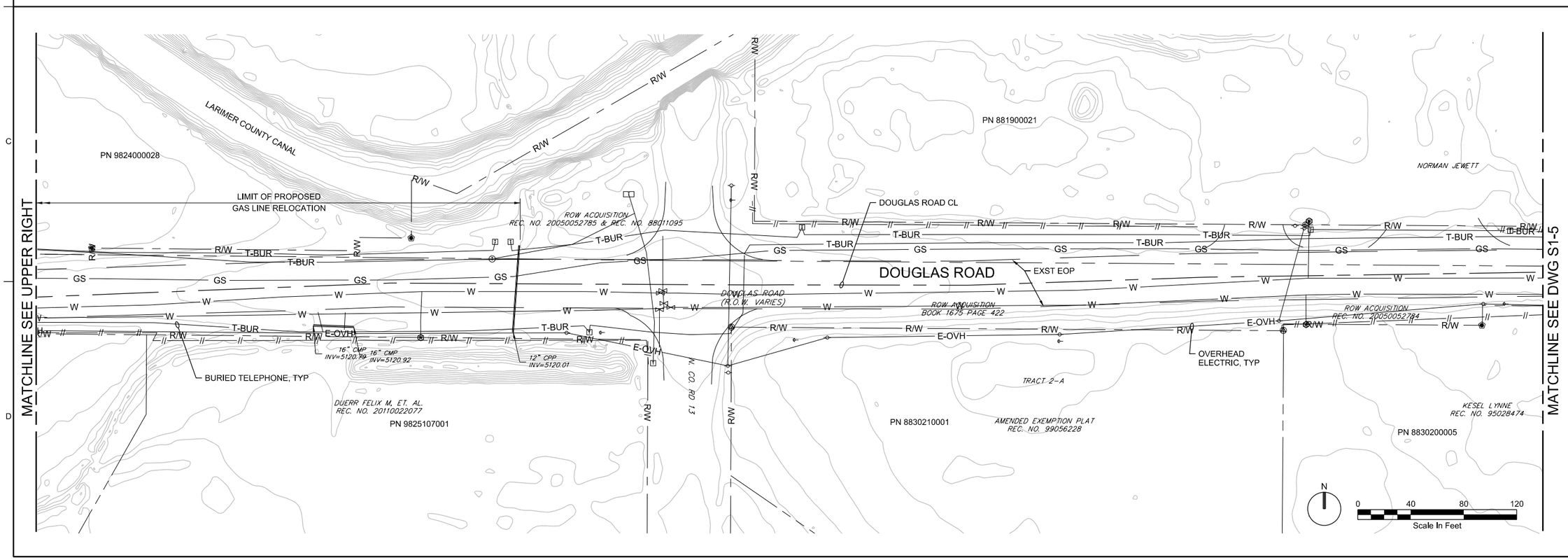

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DRAWING S1-4
FIELD SURVEY INFORMATION

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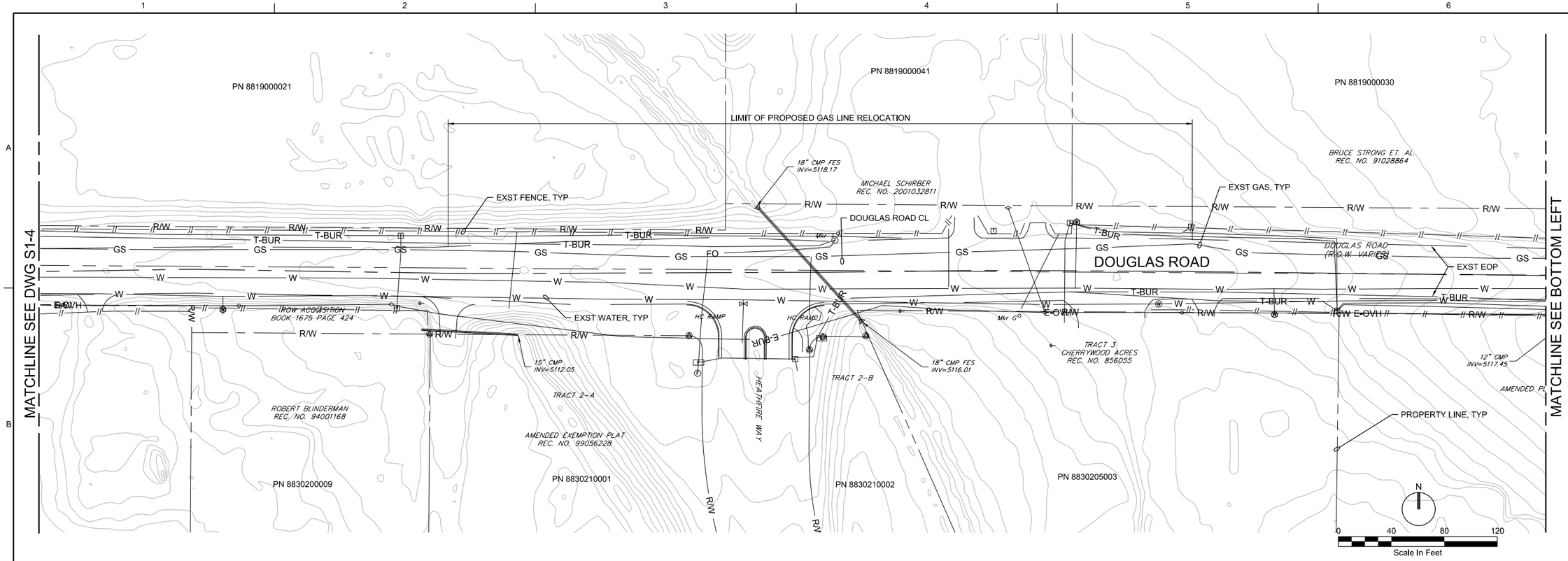

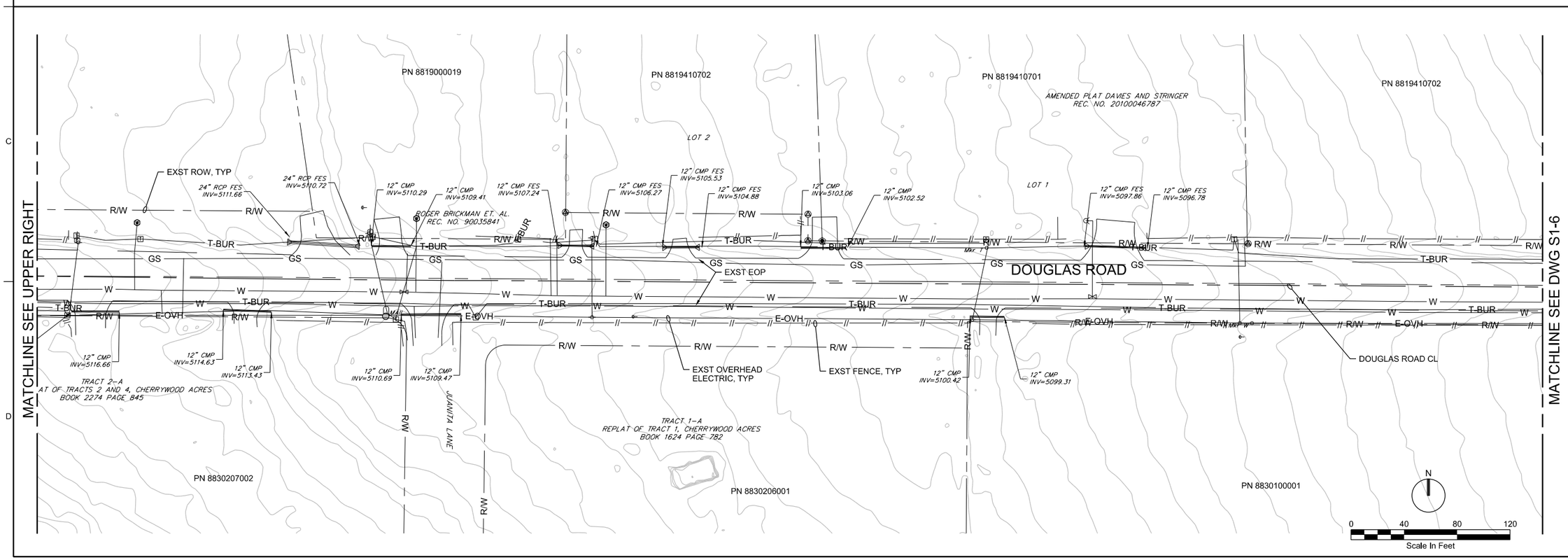

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DRAWING S1-5
FIELD SURVEY INFORMATION

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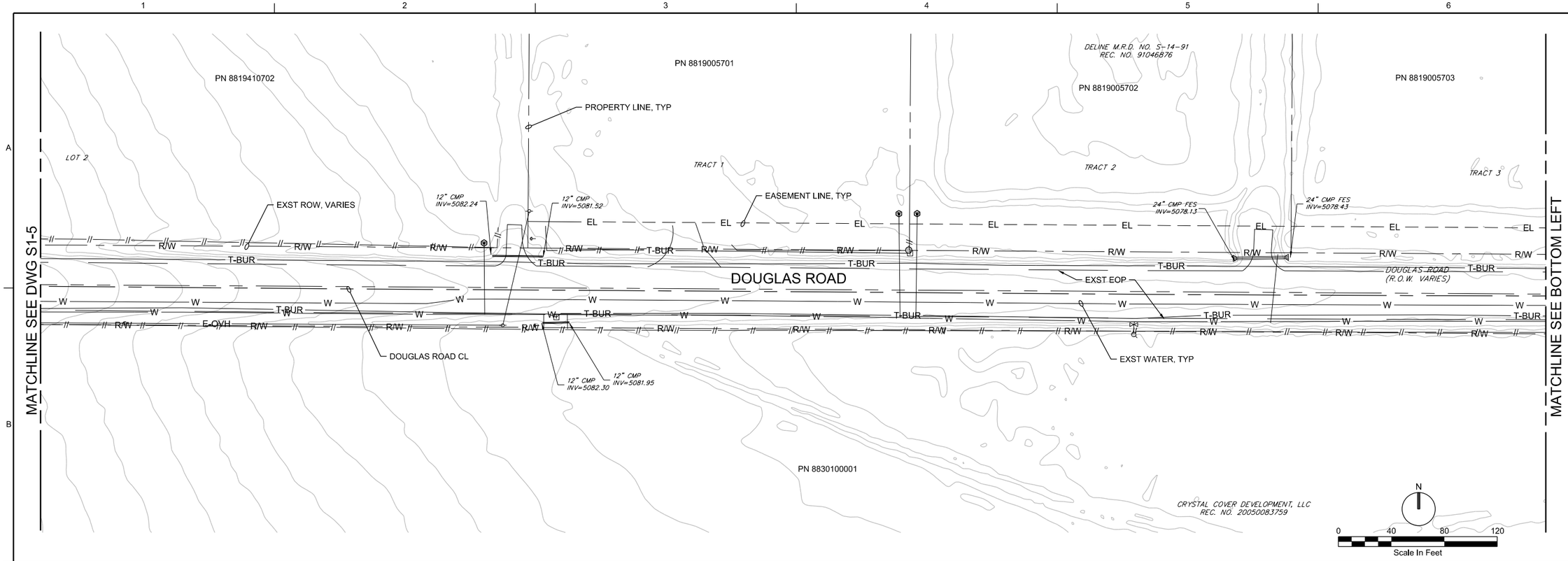

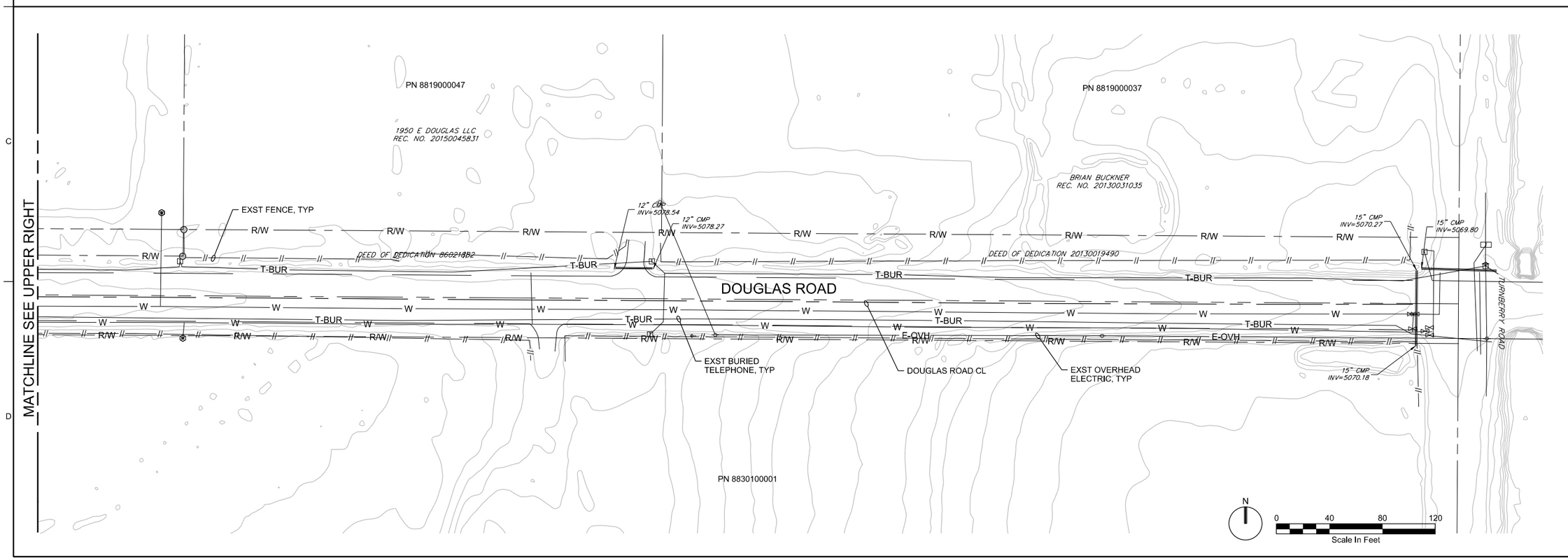

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DRAWING S1-6
FIELD SURVEY INFORMATION

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Supplement 2 Water Pipeline Alignment

This section addresses Larimer County's request for water pipeline alignment information.

Schematic level water pipeline horizontal alignment information for approximately 2.6 miles along Douglas Road from approximately Bayshore Road to Turnberry Road is shown on the drawings referenced below. Deviations to the horizontal alignment could occur during design to incorporate fittings and appurtenances. Information provided includes:

2.a Engineering drawing depicting the preferred horizontal water pipeline alignment.

See **Drawings S2-1** through **S2-6**.

2.b Engineering drawing showing the estimated extent of work area necessary for installation of water pipeline along the horizontal alignment.

See **Drawings S2-7** through **S2-12**.

2.c Drawing depicting the minimum permit corridor width along the 2.6-mile segment.

See **Drawings S2-7** through **S2-12**.

The revised TWP corridor shown on the drawings, replaces the TWP corridor provided with the Application along Douglas Road from approximately Bayshore Road to Turnberry Road.

In response to Larimer County's request *2.d A description of mitigation measures, if the corridor width is greater than a 100 feet centered along the centerline of the existing pavement of Douglas Road,* the revised TWP corridor is not greater than 100 feet centered along the centerline of the existing pavement of Douglas Road. Therefore, no mitigation measures are described.

NOTE:
SHADED AREA AROUND TWP ALIGNMENT INDICATES LIMIT OF EXCAVATION..

PN 9823300002
PN 9823405703
1 ACRE EASEMENT
LOT 3
15" CPP INV=5032.29
15" CPP INV=5031.46
10' EASEMENT
EXST EOP
24" CMP INV=5025.79
DOUGLAS ROAD CL
EXST ROW, VARIES
15" CMP INV=5040.04
15" CMP INV=5042.07
20' FUTURE ROW RESERVATION
TWP SCHEMATIC ALIGNMENT, TYP SEE NOTE
DOUGLAS ROAD
15" RCP INV=5034.21
EXST EOP
24" CMP INV=5025.20
EXST ROW, VARIES
BAYSHORE ROAD
PN 9826208001
TRACT A
PROPERTY LINE, TYP
LOT 45
PN 9826105045
LOT 46
PN 9826105046
LOT 47
PN 9826105047
LOT 48
PN 9826105048
PN 9826105049
TERRY POINT REC. NO. 9
MATCHLINE SEE BOTTOM LEFT
0 40 80 120
Scale In Feet

KESSLER M.R.D. NO. 92 REC. NO. 98024599
LOT 2
LOT 1
PN 9823405702
PN 982342170
PN 9823421702
EAGLE LAKE S
AMENDED PLAT OF TRACT REC. NO.
MATCHLINE SEE UPPER RIGHT
EXST EOP
TWP SCHEMATIC ALIGNMENT, TYP SEE NOTE
EASEMENT LINE, TYP
20' FUTURE ROW RESERVATION
18" CPP INV=5036.75
18" CPP INV=5036.75
ROW ACQUISITION REC. NO. 20090025587
15" CMP INV=5034.35
15" CMP INV=5034.95
DOUGLAS ROAD
18" CPP INV=5037.82
18" CPP INV=5036.61
DOUGLAS ROAD CL
EXST EOP
15" CMP INV=5034.92
15" CMP INV=5035.32
15" CMP INV=5033.95
LOT 49
LOT 1
LOT 2
SWAN LANE
PN 9826105001
PN 9826105002
THE POINT TOWNHOMES P.U.D. PHASE III REC. NO. 95039894
PN 9826125001
HOWARD DAVIS ET. AL. REC. NO. 20130027286
PN 9826000002
PN 9826129002
MATCHLINE SEE DWG S2-2
0 40 80 120
Scale In Feet

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DRAWING S2-1
WATER PIPELINE SCHEMATIC ALIGNMENT

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
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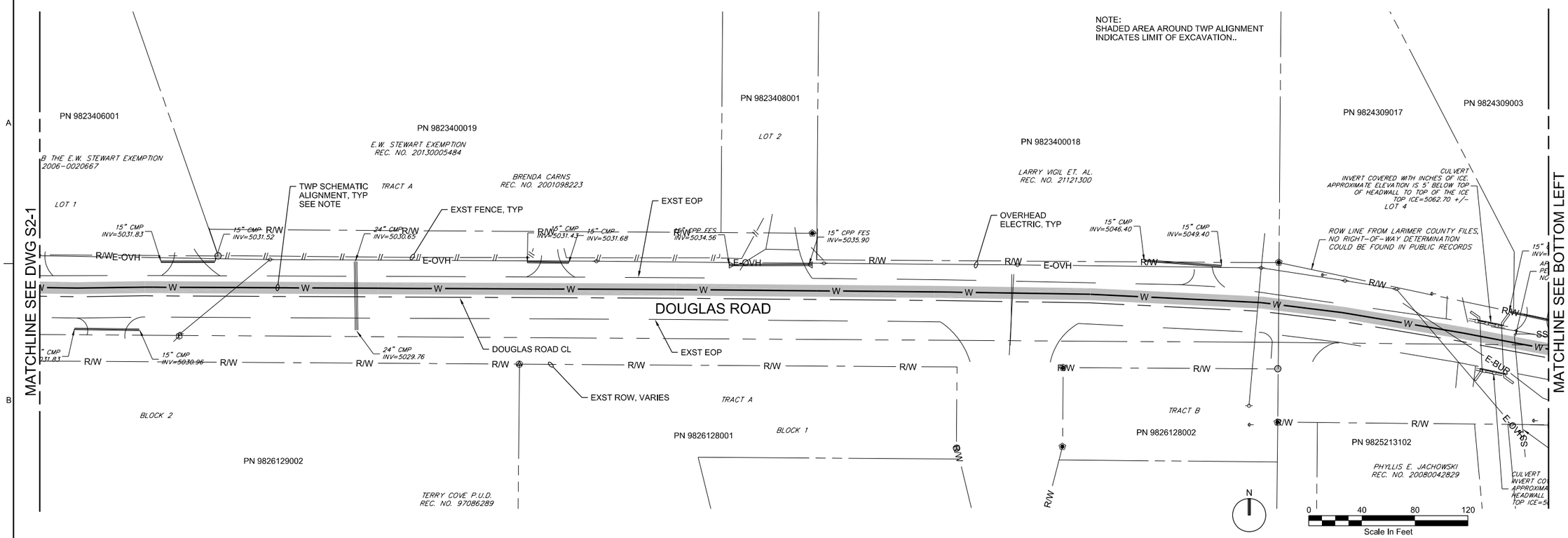
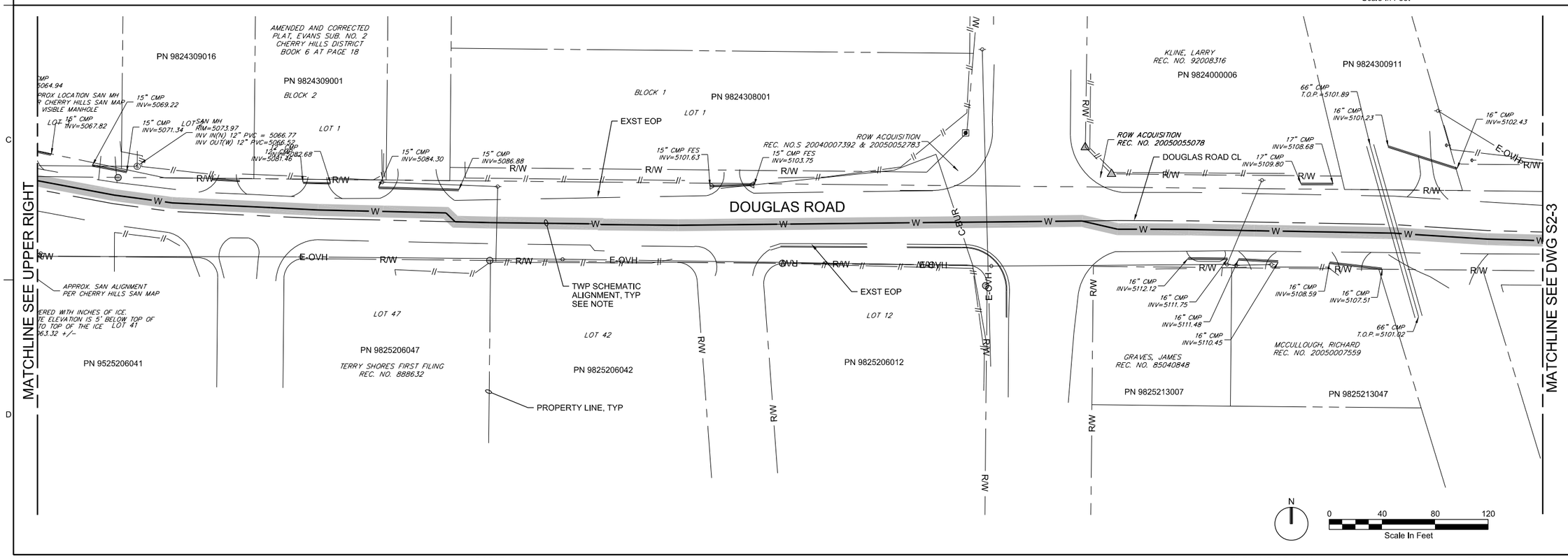
0 1"

DATE	MARCH 2018
PROJ	000181
DWG	S2-1
SHEET	of





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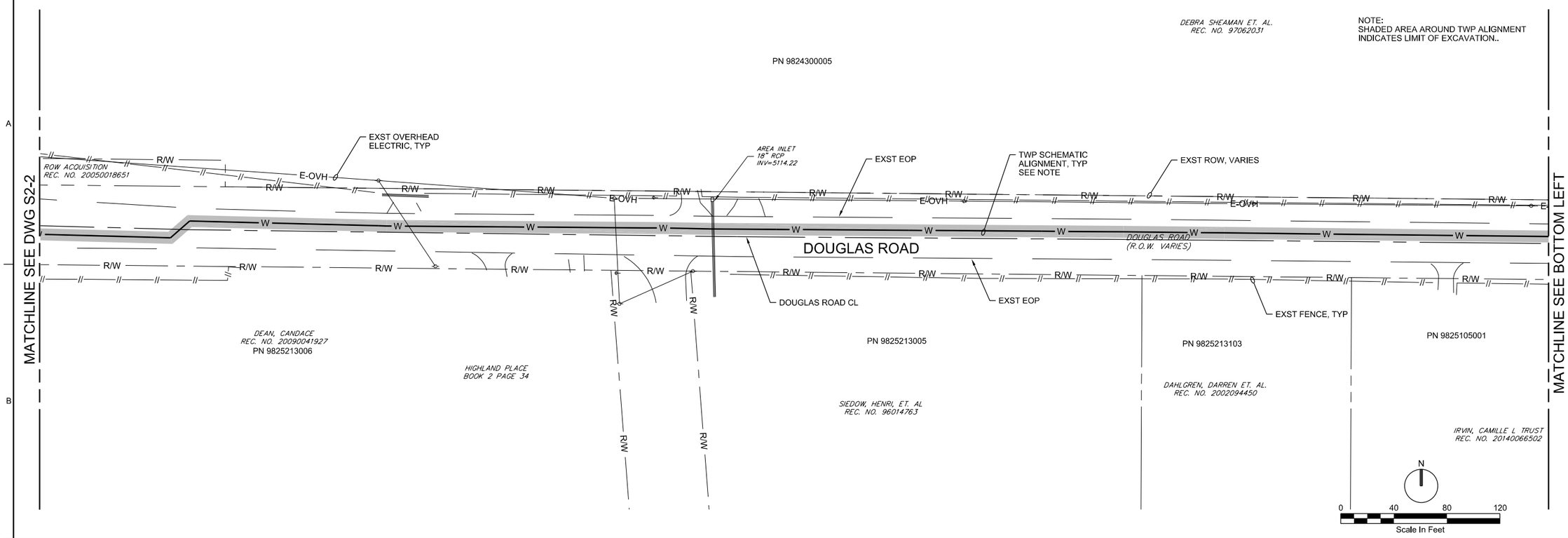
DRAWING S2-2
WATER PIPELINE
SCHEMATIC ALIGNMENT

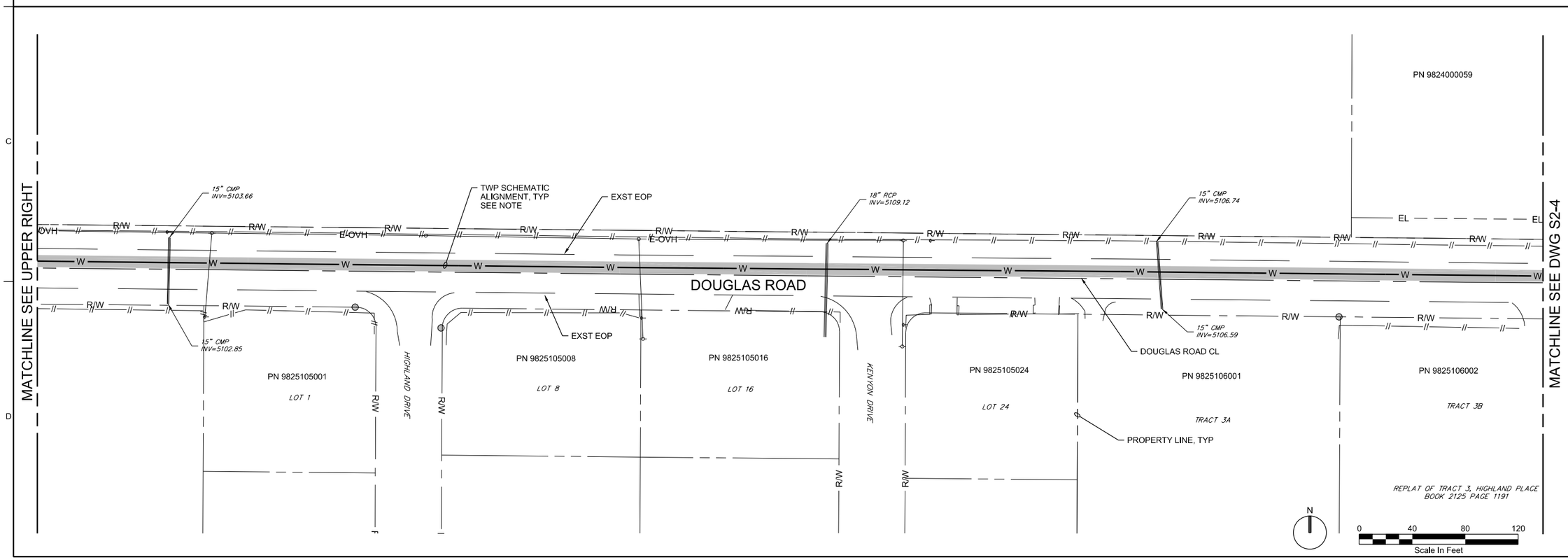
CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2018
PROJ	000181
DWG	S2-2
SHEET	of

NOTE:
SHADED AREA AROUND TWP ALIGNMENT INDICATES LIMIT OF EXCAVATION..





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DRAWING S2-3
WATER PIPELINE
SCHEMATIC ALIGNMENT

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
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DATE	MARCH 2018
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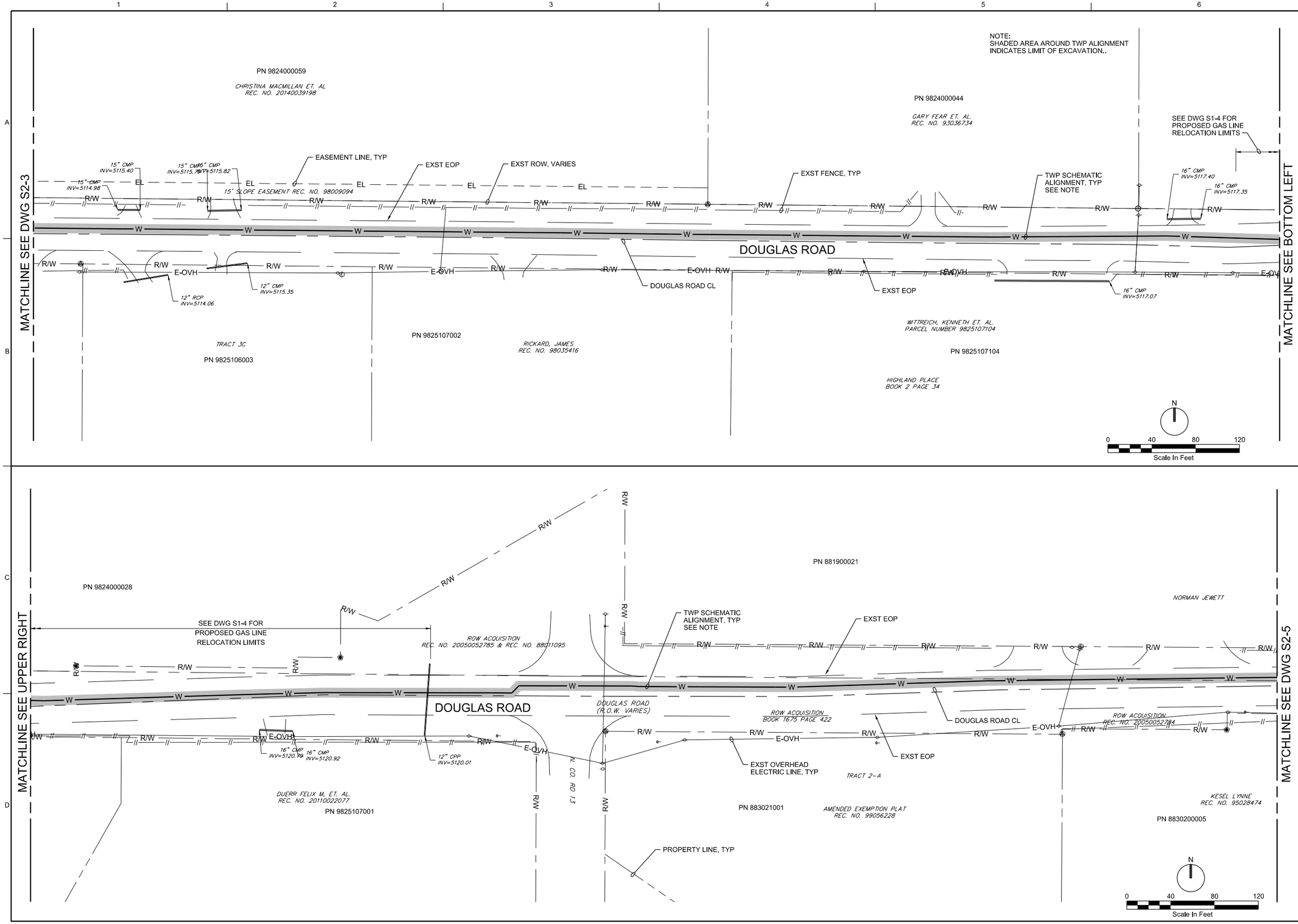
DWG	S2-3
SHEET	of



NO.	DATE	REVISION	BY	APVD

DSGN	DR	CHK	APVD
T STOUT	M MONAHAN	T STOUT	T STOUT

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DRAWING S2-4
WATER PIPELINE
SCHEMATIC ALIGNMENT

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2018
PROJ	000181
DWG	S2-4
SHEET	of

NOTE:
SHADED AREA AROUND TWP ALIGNMENT INDICATES LIMIT OF EXCAVATION.

PN 8819000021
PN 8819000041
PN 8819000030
SEE DWG S1-5 FOR PROPOSED GAS LINE RELOCATION LIMITS
MATCHLINE SEE DWG S2-4
MATCHLINE SEE BOTTOM LEFT
EASEMENT LINE, TYP
TWP SCHEMATIC ALIGNMENT, TYP SEE NOTE
EXST FENCE, TYP
18" CMP FES INV=5118.17
MICHAEL SCHIRBER REC. NO. 2001032811
BRUCE STRONG ET. AL. REC. NO. 91028864
EXST ROW, VARIES
EXST EOP
DOUGLAS ROAD (R.O.W. VARIES)
DOUGLAS ROAD
DOUGLAS ROAD CL
ROW ACQUISITION BOOK 1675 PAGE 424
HC RAMP
E-BUR
HEATHERE WAY
15" CMP INV=5112.05
18" CMP FES INV=5116.01
TRACT 3 CHERRYWOOD ACRES REC. NO. 856055
12" CMP INV=5117.45
AMENDED PL
TRACT 2-A
TRACT 2-B
ROBERT BLINDERMAN REC. NO. 94001168
AMENDED EXEMPTION PLAT REC. NO. 99056228
PROPERTY LINE, TYP
PN 8830200009
PN 8830210001
PN 8830210002
PN 8830205003
Scale In Feet

PN 8819000019
PN 8819410702
PN 8819410701
PN 8819410702
AMENDED PLAT DAVIES AND STRINGER REC. NO. 20100046787
LOT 2
LOT 1
MATCHLINE SEE UPPER RIGHT
MATCHLINE SEE DWG S2-6
24" RCP FES INV=5111.66
24" RCP FES INV=5110.72
12" CMP INV=5110.29
12" CMP INV=5109.41
12" CMP FES INV=5107.24
12" CMP FES INV=5106.27
12" CMP FES INV=5105.53
12" CMP FES INV=5104.88
12" CMP INV=5103.06
12" CMP INV=5102.52
12" CMP FES INV=5097.86
12" CMP FES INV=5096.78
ROGER BRICKMAN ET. AL. REC. NO. 90035841
EXST EOP
12" CMP INV=5116.66
12" CMP INV=5114.63
12" CMP INV=5113.43
12" CMP INV=5110.69
12" CMP INV=5109.47
12" CMP INV=5100.42
12" CMP INV=5099.31
TRACT 2-A AT OF TRACTS 2 AND 4, CHERRYWOOD ACRES BOOK 2274 PAGE 845
JUANITA LANE
TWP SCHEMATIC ALIGNMENT, TYP SEE NOTE
EXST OVERHEAD ELECTRIC, TYP
EXST FENCE, TYP
DOUGLAS ROAD CL
TRACT 1-A REPLAT OF TRACT 1, CHERRYWOOD ACRES BOOK 1624 PAGE 782
PN 8830207002
PN 8830206001
PN 8830100001
Scale In Feet

NO.	DATE	REVISION	BY	APVD

DSGN T STOUT | DR M MONAHAN | CHK T STOUT | APVD T STOUT

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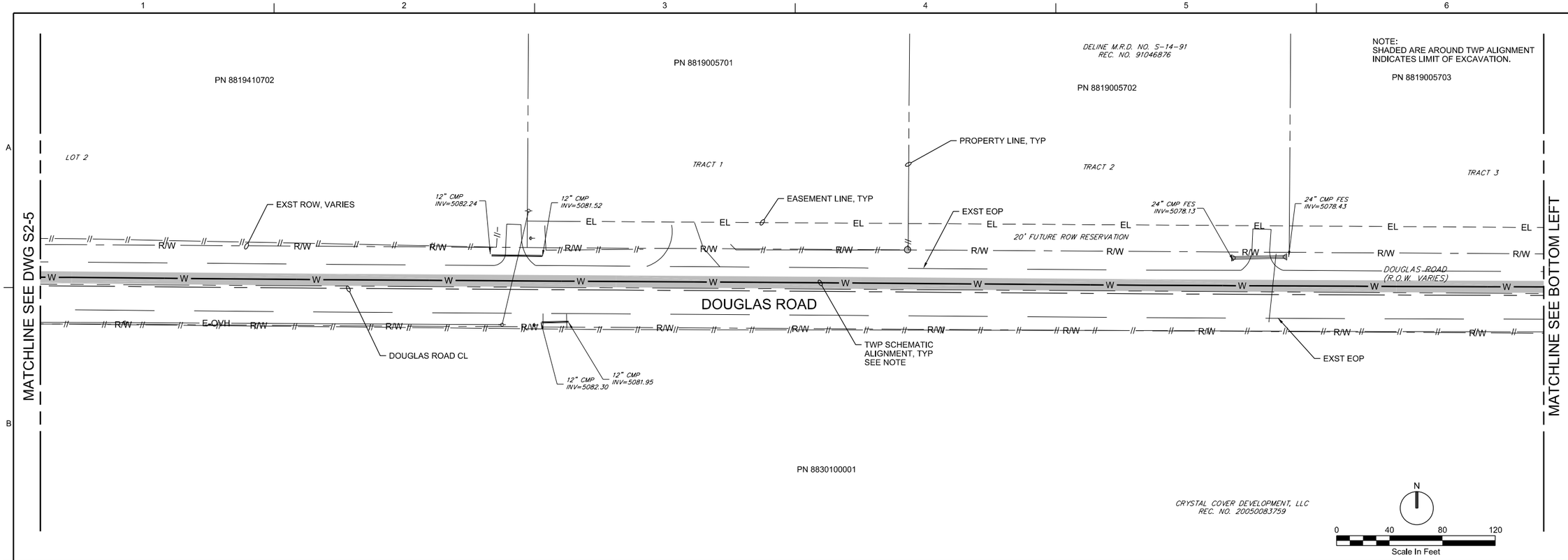
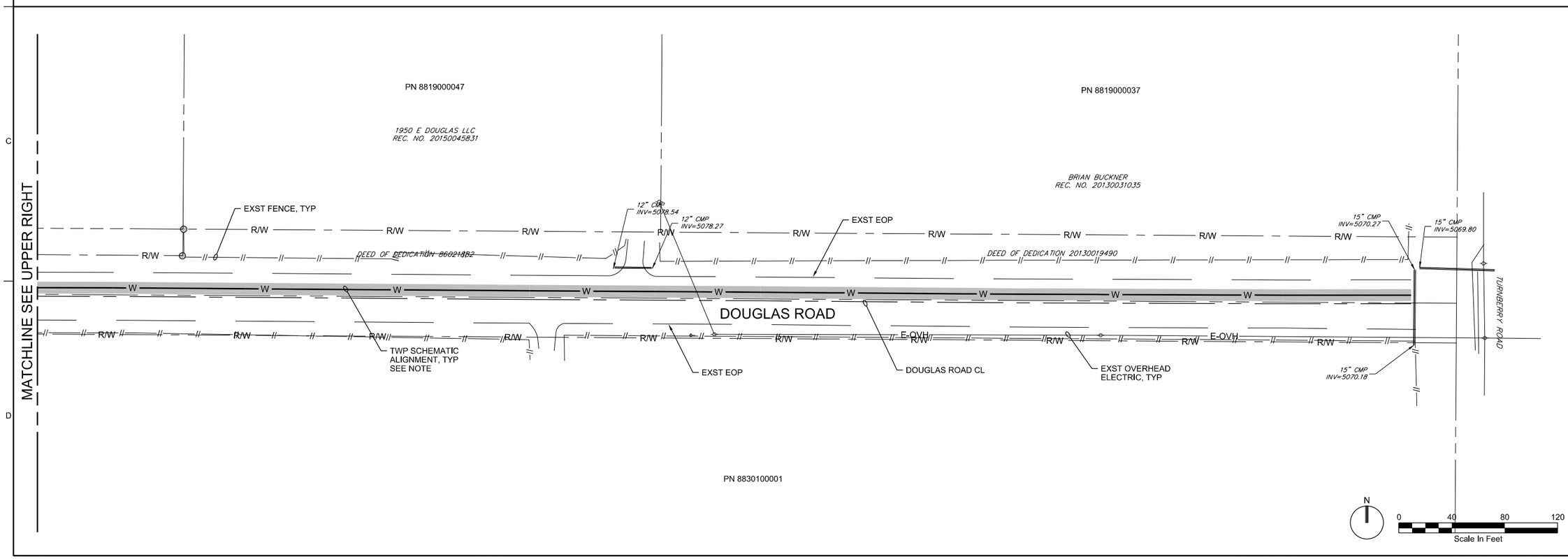
DRAWING S2-5
WATER PIPELINE
SCHEMATIC ALIGNMENT

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2018
PROJ	000181
DWG	S2-5
SHEET	of





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CITY OF THORNTON
THORNTON, CO

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DRAWING S2-6
WATER PIPELINE
SCHEMATIC ALIGNMENT

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2018
PROJ	000181
DWG	S2-6
SHEET	of

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WORK LIMITS AND REVISED TWP CORRIDOR

PN 9823300002

PN 9823405703

LOT 3

EXST ROW, VARIES

EXST EOP

DOUGLAS ROAD

DOUGLAS ROAD CL

EXST ROW, VARIES

EXST EOP

BAYSHORE ROAD

PN 9826208001

TRACT A

PROPERTY LINE, TYP

LOT 45

PN 9826105045

LOT 46

PN 9826105046

LOT 47

PN 9826105047

LOT 48

PN 9826105048

PN 9826105049

TERRY POINT REC. NO. 9

MATCHLINE SEE BOTTOM LEFT

0 40 80 120

Scale In Feet

KESSLER M.R.D. NO. 92
REC. NO. 98024599

LOT 2

PN 9823405702

LOT 1

PN 982342170

LOT 2

PN 9823421702

EAGLE LAKE 5

AMENDED PLAT OF TRACT
REC. NO.

MATCHLINE SEE UPPER RIGHT

MATCHLINE SEE DWG S2-8

20' FUTURE ROW RESERVATION

EXST EOP

ROW ACQUISITION
REC. NO. 20090025587

DOUGLAS ROAD

EXST EOP

DOUGLAS ROAD CL

LOT 49

ESTATES
41956

SWAN LANE

LOT 1

PN 9826105001

LOT 2

PN 9826105002

THE POINT TOWNHOMES P.U.D. PHASE III
REC. NO. 95039894

PN 9826125001

HOWARD DAVIS ET. AL.
REC. NO. 20130027286

PN 9826000002

PN 9826129002

0 40 80 120

Scale In Feet

NO.	DATE	DR	REVISION	CHK	APVD	BY	APVD
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DRAWING S2-7
WORK LIMITS AND
REVISED TWP CORRIDOR

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2018
PROJ	000181
DWG	S2-7
SHEET	of

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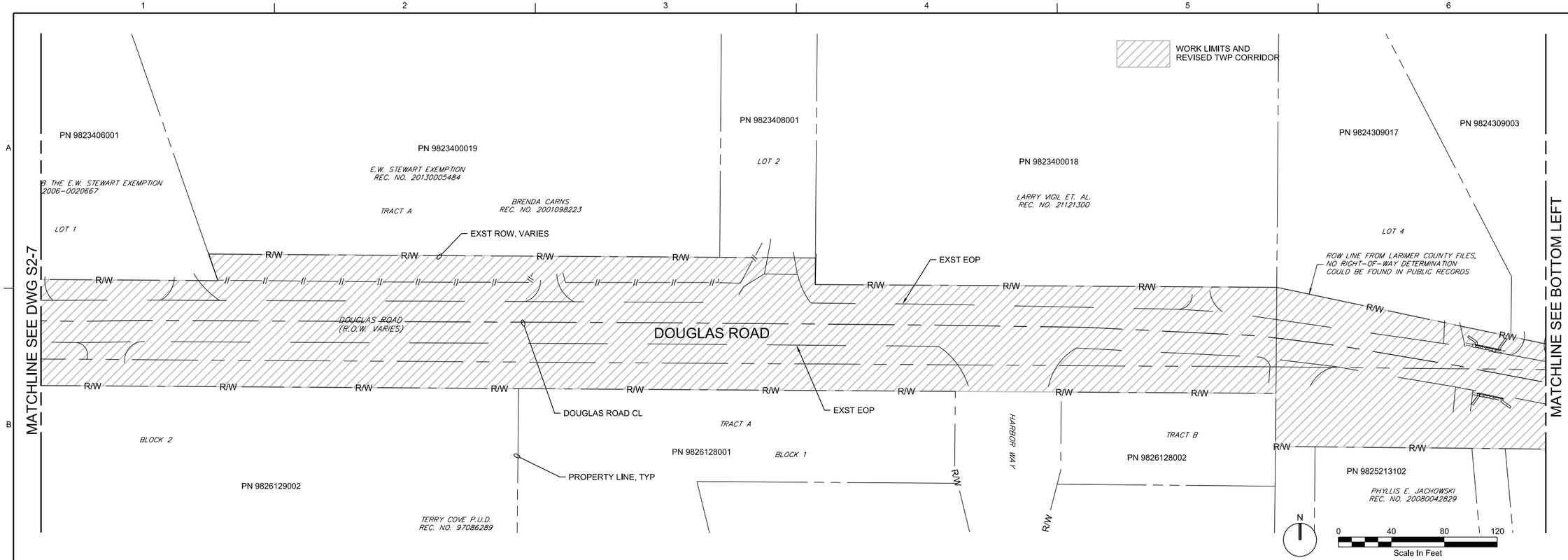

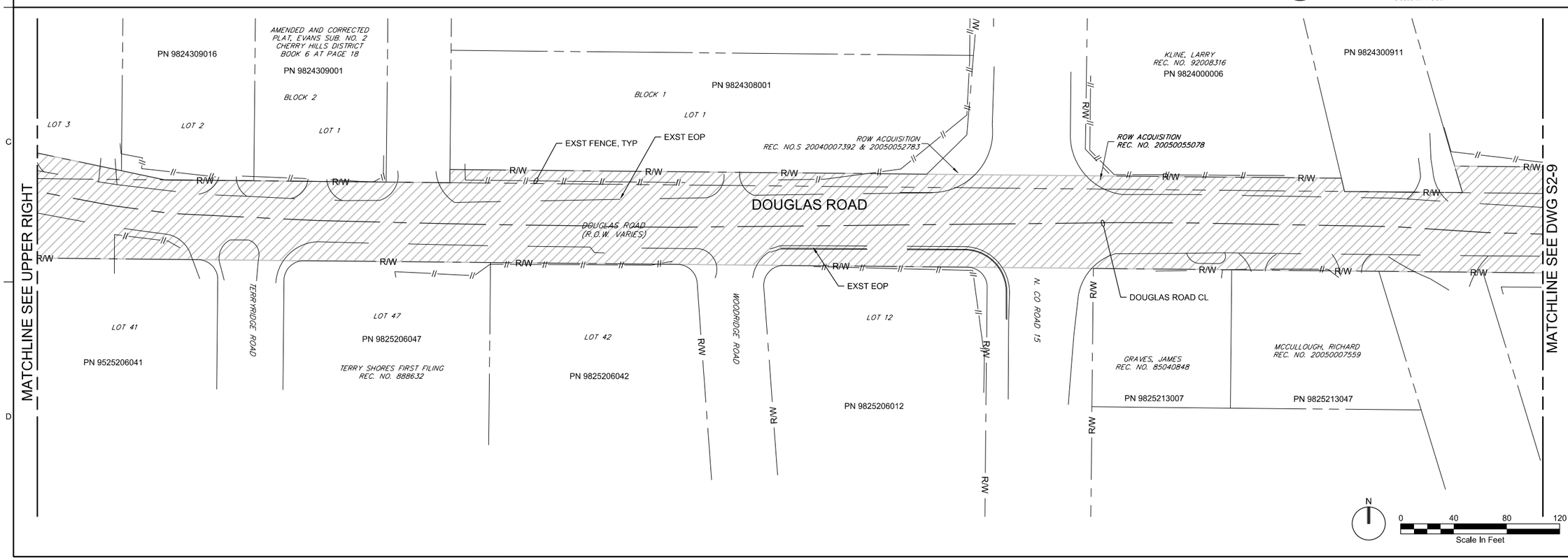

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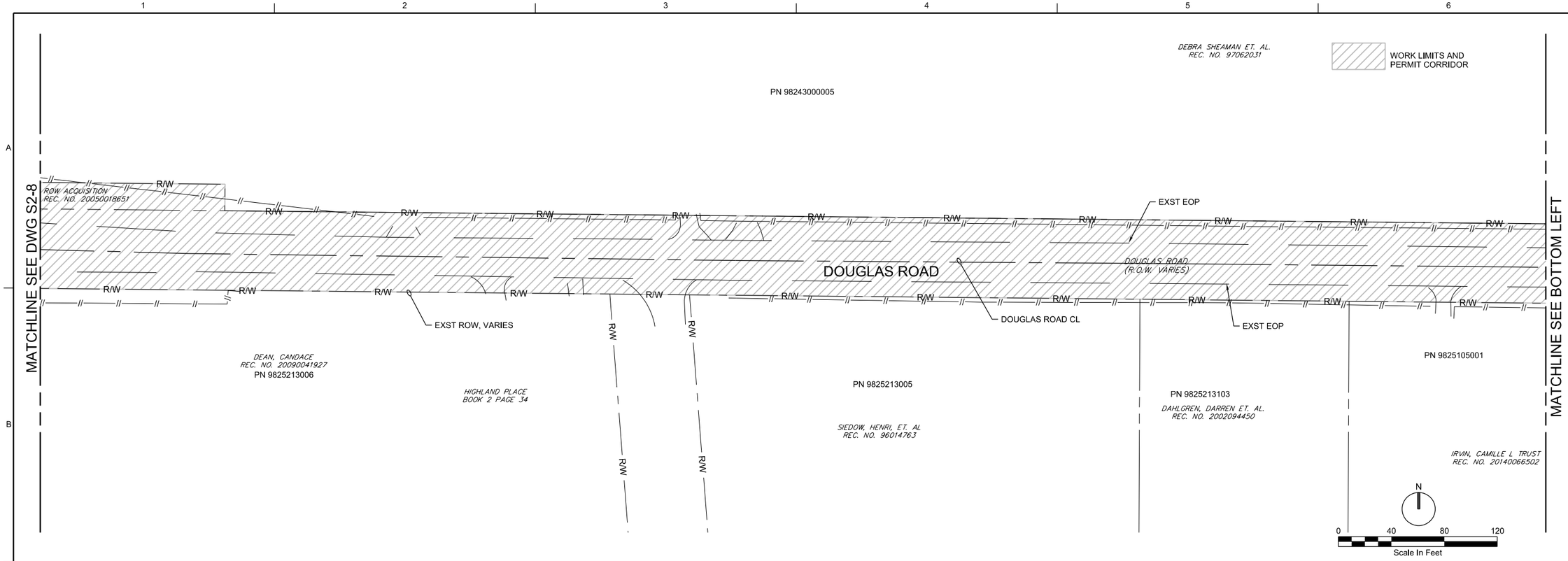
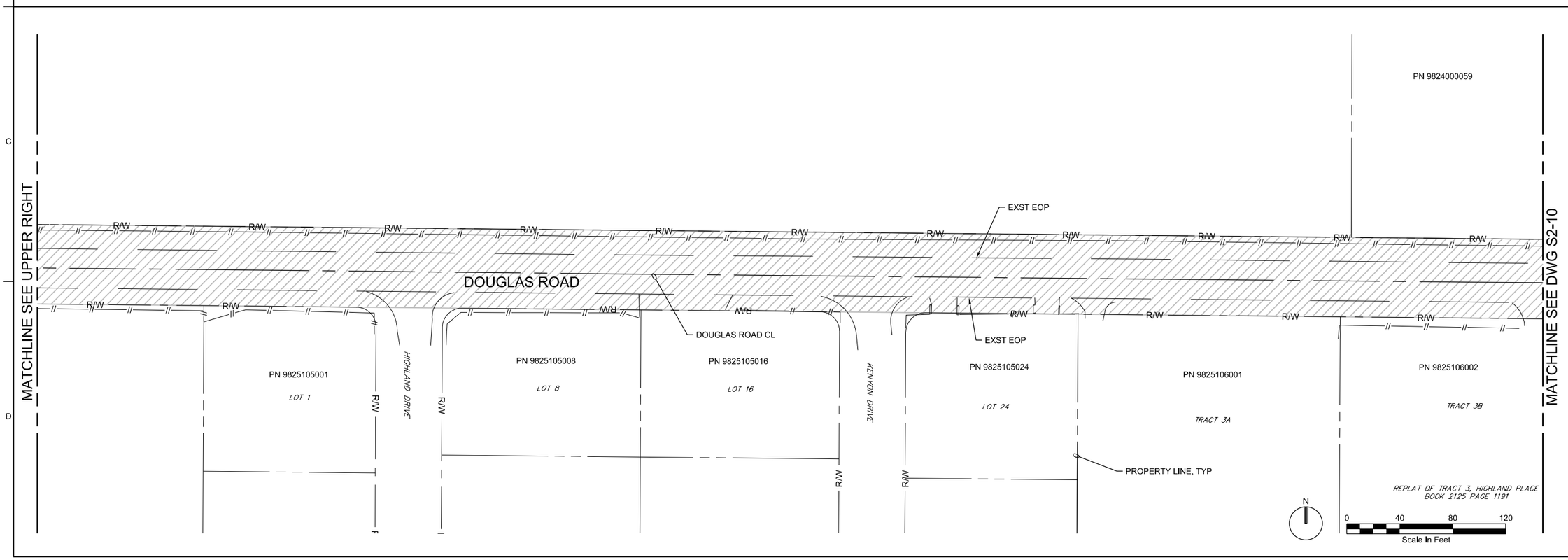
DRAWING S2-8
WORK LIMITS AND REVISED TWP CORRIDOR

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2018
PROJ	000181
DWG	S2-8
SHEET	of





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DRAWING S2-9
WORK LIMITS AND
REVISED TWP CORRIDOR

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2018
PROJ	000181
DWG	S2-9
SHEET	of

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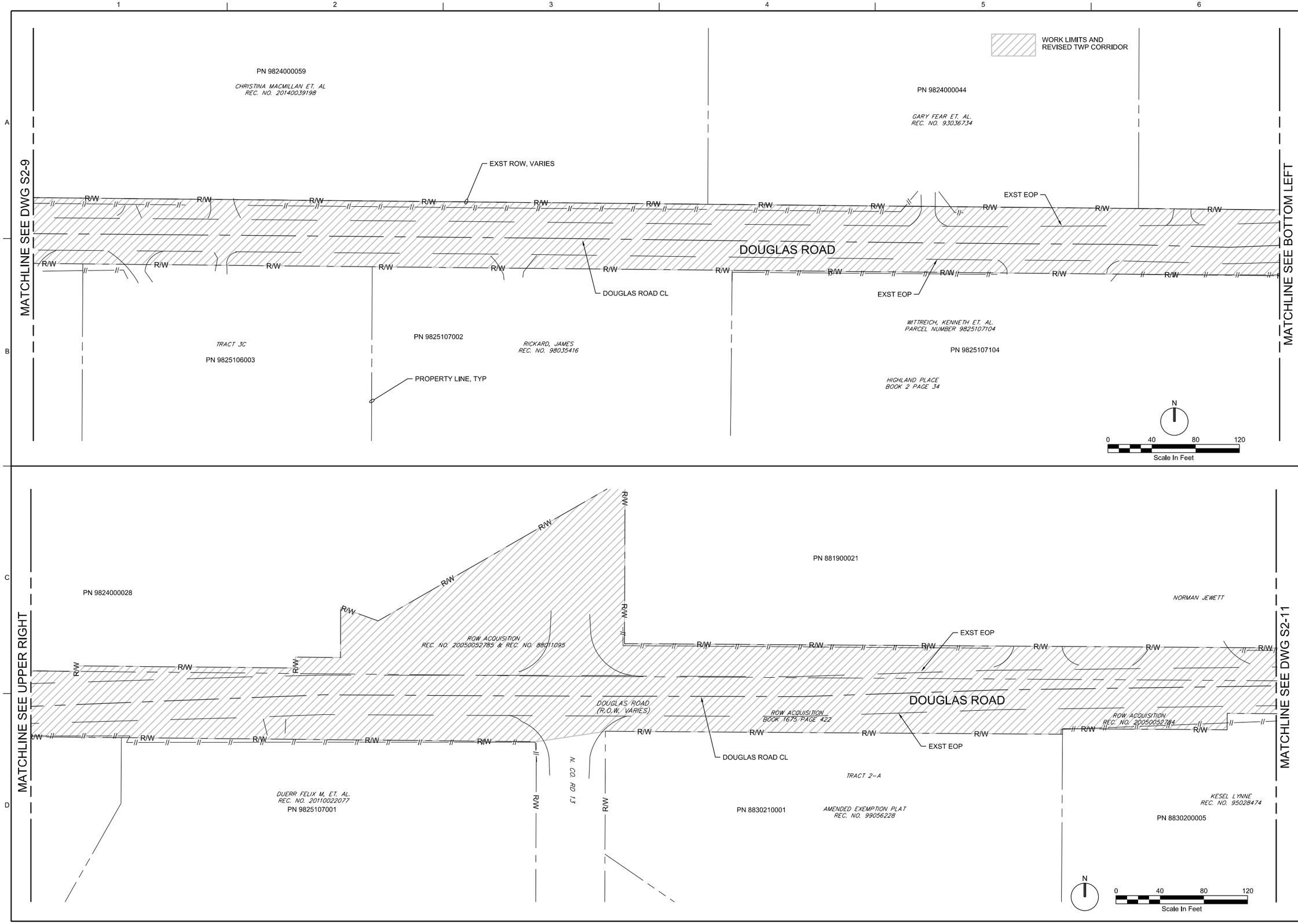

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DRAWING S2-10
WORK LIMITS AND REVISED TWP CORRIDOR

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
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0 1"

DATE	MARCH 2018
PROJ	000181
DWG	S2-10
SHEET	of

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NO.	DATE	REVISION	BY	APVD
DSGN	T STOUT	DR M MONAHAN	CHK T STOUT	APVD T STOUT

THORNTON WATER PROJECT
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DRAWING S2-11
WORK LIMITS AND
REVISED TWP CORRIDOR

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VERIFY SCALE
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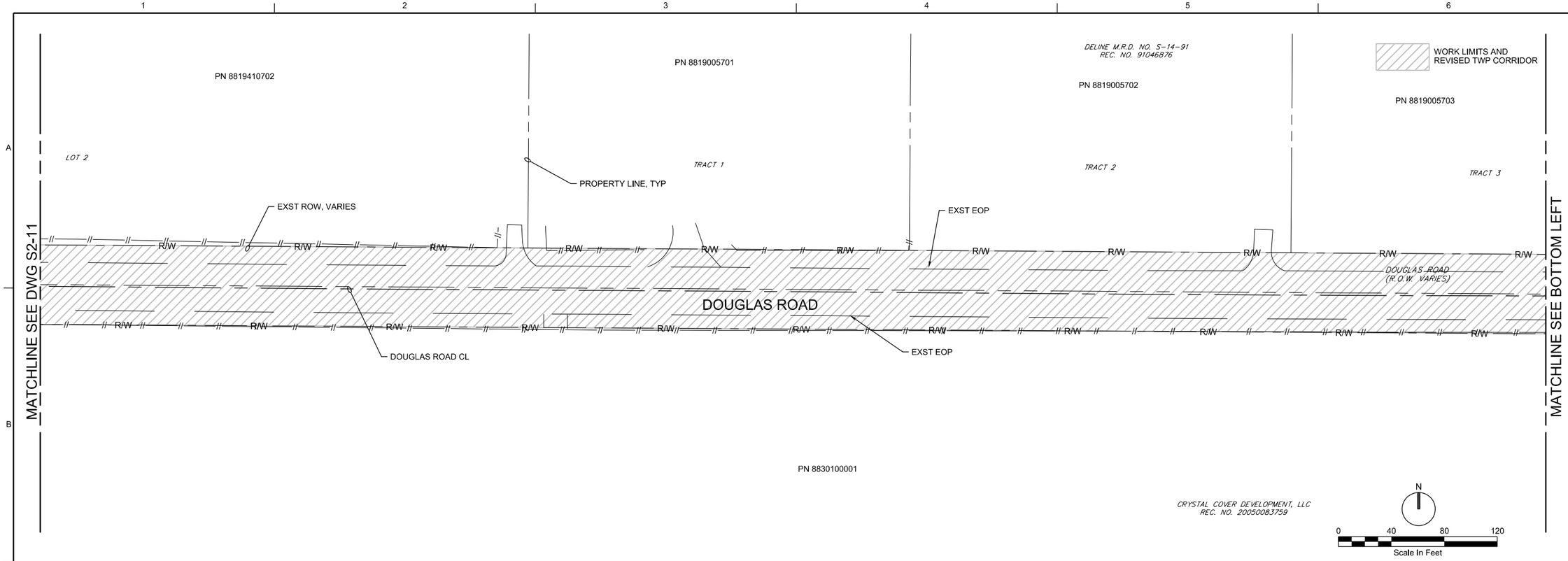
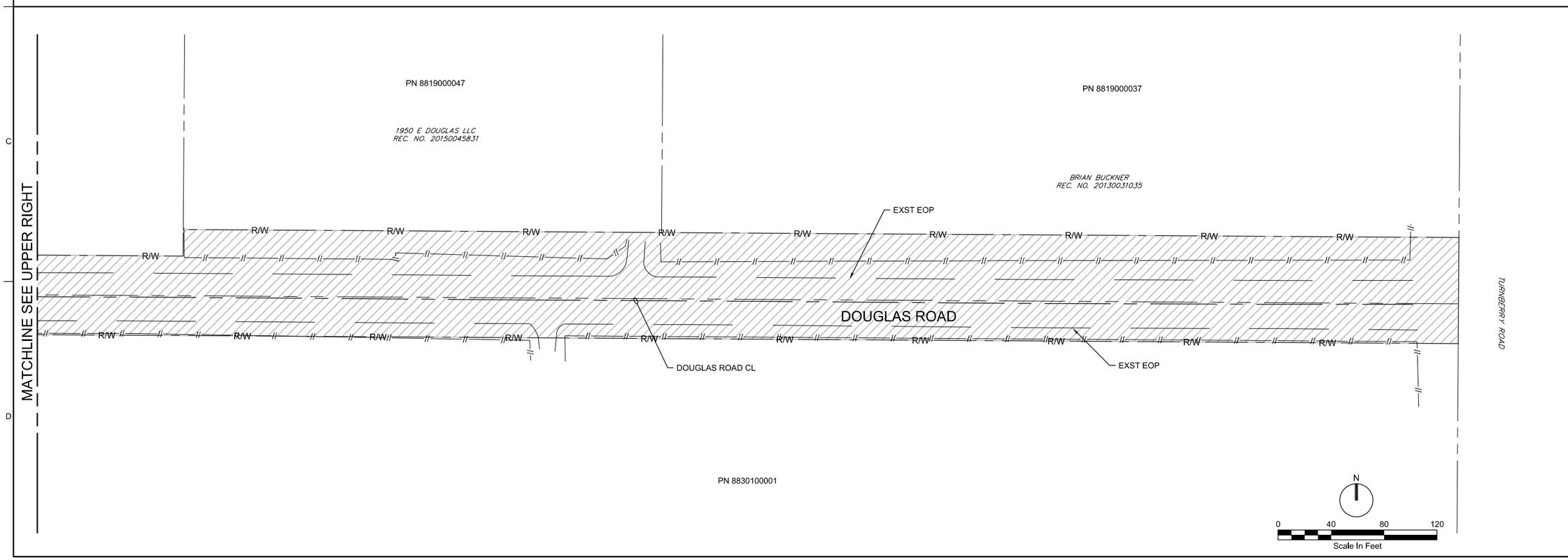
PROJ	000181
DWG	S2-11
SHEET	of





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DRAWING S2-12
WORK LIMITS AND REVISED TWP CORRIDOR

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2018
PROJ	000181
DWG	S2-12
SHEET	of

Supplement 3 Anticipated Construction Schedule

This section addresses Larimer County's request for the anticipated construction schedule.

Provided below is a discussion of the sequence and duration of water pipeline construction activities, including the anticipated construction year and season by roadway segment identified in Larimer County's information request letter dated January 26, 2018.

Construction of a water pipeline within a paved road involves many sequential activities. In advance of construction, the TWP contractor will identify traffic control methods and submit and obtain approval of their traffic control plan from Larimer County. Based on the proposed alignment of the water pipeline within a travel lane of the road, it is anticipated that the TWP contractor will request closure of that traffic lane and provide flaggers to direct traffic around the active zone of construction. During non-working hours a temporary, signalized, lane closure would be used. This active zone of construction will be of sufficient length to accommodate the excavation equipment used to excavate the trench, place the pipe for the water pipeline, weld the joints between pipe segments, and backfill the trench. This active zone of construction will continuously move forward as the water pipeline is installed. It is anticipated that no more than 400 feet of active construction zone will be required for construction along Douglas Road at any given time.

Following mobilization to the site the TWP contractor will typically install its traffic control and mobilize equipment to the active construction zone. Existing pavement will be cut and removed to expose the subgrade and the trench excavator will begin excavating the trench. Trench boxes are expected to be used to keep the excavation as narrow as is possible while maintaining a safe active construction zone. Excavated material will be stockpiled on the side of the trench opposite to the open travel lane. Once the trench is excavated to the required grade (approximately 6 to 12 inches below the proposed pipe invert elevation), bedding material will be placed and compacted to provide a bed for placement of the pipe. The pipe will be placed and the zone around the pipe from the top of the bedding to a point 1 foot above the pipe will be backfilled with suitable material and compacted. The remainder of the trench will then be backfilled with suitable, excavated material and compacted. It is anticipated that the active construction zone will be a continuously moving operation with trench excavation occurring on the leading edge and backfilling occurring on the following edge. Following backfilling, temporary surfacing meeting the requirements of Larimer County will be applied and vehicular access restored. The temporary surfacing will remain in place until permanent paving operations are initiated following completion of the pipe laying process.

The identified construction year and season are based on the following assumptions:

- Request is for water pipeline and associated appurtenances construction only and does not include source water pump station construction.
- Pipeline alignment and pavement replacement are as proposed in Supplement 2.
- Possible existing utility relocations as identified in Supplement 2 are included and coordinated with the water pipeline construction.
- To provide a quality finished pavement surface, permanent surfacing will be conducted as a single continuous process following completion of the water pipeline construction.
- Larimer County 1041 Permit is approved and issued early summer 2018.
- Design procurement, design and construction bidding will start upon Larimer County 1041 Permit approval and be complete by late spring/early summer of 2020.
- Notice to proceed with construction will be issued early summer 2020.

- Raptor nests are either not within Colorado Parks and Wildlife (CPW) recommended distances of Douglas Road, or construction can be sequenced to avoid construction within recommended distances during CPW recommended avoidance months (see raptor discussion below).
- TWP contractor's pipe procurement process will take approximately 12 to 16 weeks.

3.a Pipeline segment located west of State Highway 1.

This segment of the water pipeline is approximately 4,200 feet of pipeline and is proposed to be constructed first. Pipe is expected to be available in late summer 2020 and water pipeline construction will commence and is expected to be finished before the end of 2020. Final paving for this segment will be delayed until all water pipeline segments have been completed, which is expected to occur late summer of 2021.

3.b Pipeline segment located between State Highway 1 and County Road 11 (Turnberry Road).

This segment of the water pipeline is approximately 9,500 feet of pipeline and is proposed to be constructed last. Construction is anticipated to begin near the beginning of 2021 and be complete by late summer of 2021. Final paving for this segment will be coordinated with final paving for the entire limits of construction which is scheduled to begin mid-summer 2021 at the segment west of Highway 1 and proceed east and be complete by late summer 2021.

3.c Pipeline segment crossing State Highway 1, given the anticipated traffic signal installation.

This segment of the water pipeline is approximately 150 feet of pipeline and is subject to a license agreement with the Colorado Department of Transportation (CDOT). CDOT typically requires that crossings of their right-of-way be tunneled and cased. A tunneled crossing requires construction of drive and receiving pits, requiring up to one week to construct and another week to construct the tunnel and install the water pipeline for a total of 2 weeks of construction. An alternative proposal that more quickly completes this segment is to construct the water pipeline continuously over a 2 or 3-day period, typically a weekend, using conventional open-cut trenching. Regardless of the construction method, this segment is proposed to be constructed following construction of the segment west of State Highway 1 and is expected to occur in early winter 2020/2021. Temporary paving of this segment if open-cut methods are approved is assumed until paving batch plants reopen in the spring. Alternatively, this segment could be constructed within the paving season (March/April to November).

The proposed depth and location of the water pipeline within the existing pavement of Douglas Road is not expected to interfere with traffic signal masts or electrical conduits for Larimer County's proposed traffic signal project at this intersection. The design of the water pipeline through this intersection will be coordinated with Larimer County's traffic signal project.

Raptors

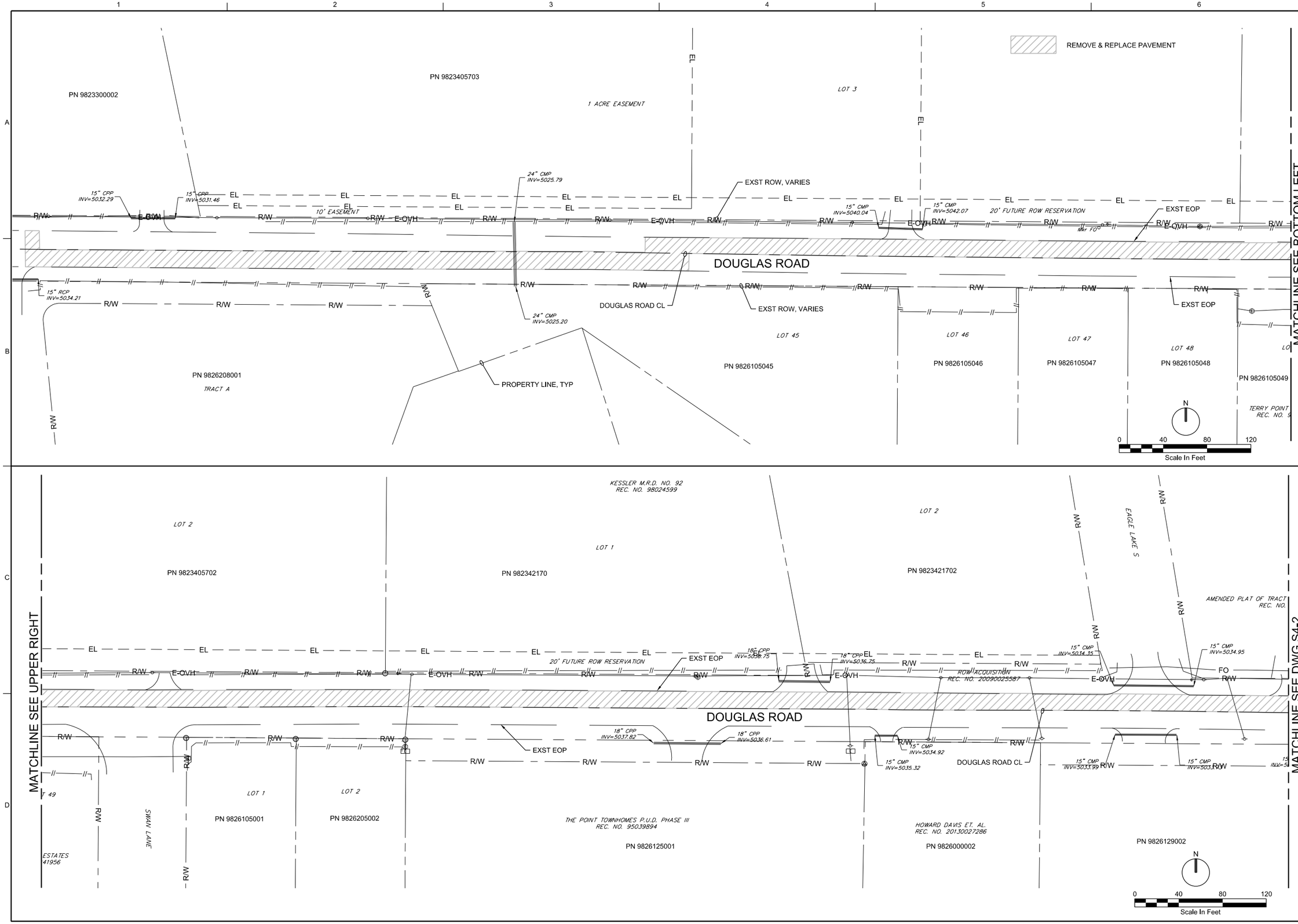
Raptors are federally protected under the Migratory Bird Treaty Act. CPW has published recommended buffer zones and seasonal restrictions for raptors in Colorado to minimize the effects of disturbance. Thornton will review the CPW raptor nest data and perform nest surveys for raptors prior to the nesting season to identify potential active raptor nests prior to construction. Thornton will coordinate with CPW regarding any potential conflicts between scheduled construction and potential raptor nests and develop measures acceptable to CPW to minimize impacts on nesting raptors.

Supplement 4 Pavement Restoration Plan

This section addresses Larimer County's request for pavement restoration plans.

The pavement restoration plan is based on Chapter 12 of the *Larimer County Rural Area Road Standards, Right of Way Permitting and Construction Standards for Facilities Located in Public Right of Way* (*Chapter 12*). The extents of pavement restoration are shown on **Drawings S4-1** through **S4-6.** Restoration of pavement will be completed to a condition equivalent to pre-construction conditions. Extents of pavement restoration are based on the following criteria per *Chapter 12*:

1. Pavement removal will be accomplished by saw cutting 2-feet outside the trench wall. Trench width is anticipated to be 9 feet. Where saw cut is less than 36 inches from the edge of pavement, pavement will be removed and replaced to edge of pavement.
2. Where the schematic alignment is located in the center of a lane, the entire lane will be removed and replaced.
3. Where the schematic alignment is on the centerline of the road, pavement will be removed and replaced from the approximate center of the adjacent lanes on each side of the trench.
4. Where the schematic alignment is not parallel to the road (changes from center lane to center line), the entire width of the road will be removed and replaced.
5. Asphalt pavement depth will match existing pavement depth, minimum 6-8 inches for Collector Road classification.
6. Pavement subgrade prep will be based on geotechnical information to be gathered during final design, but not less than *Chapter 12* requirements.



NO.	DATE	DR	REVISION	CHK	BY	APVD
DSGN	T STOUT	M MONAHAN		T STOUT		T STOUT

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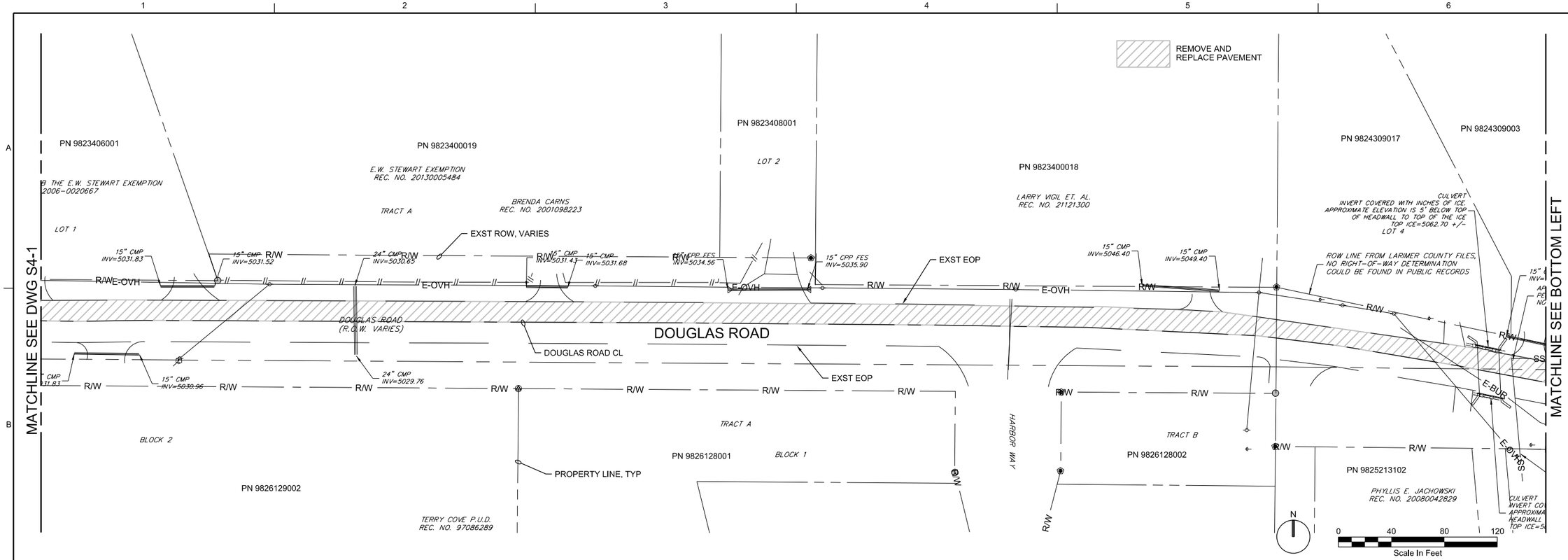
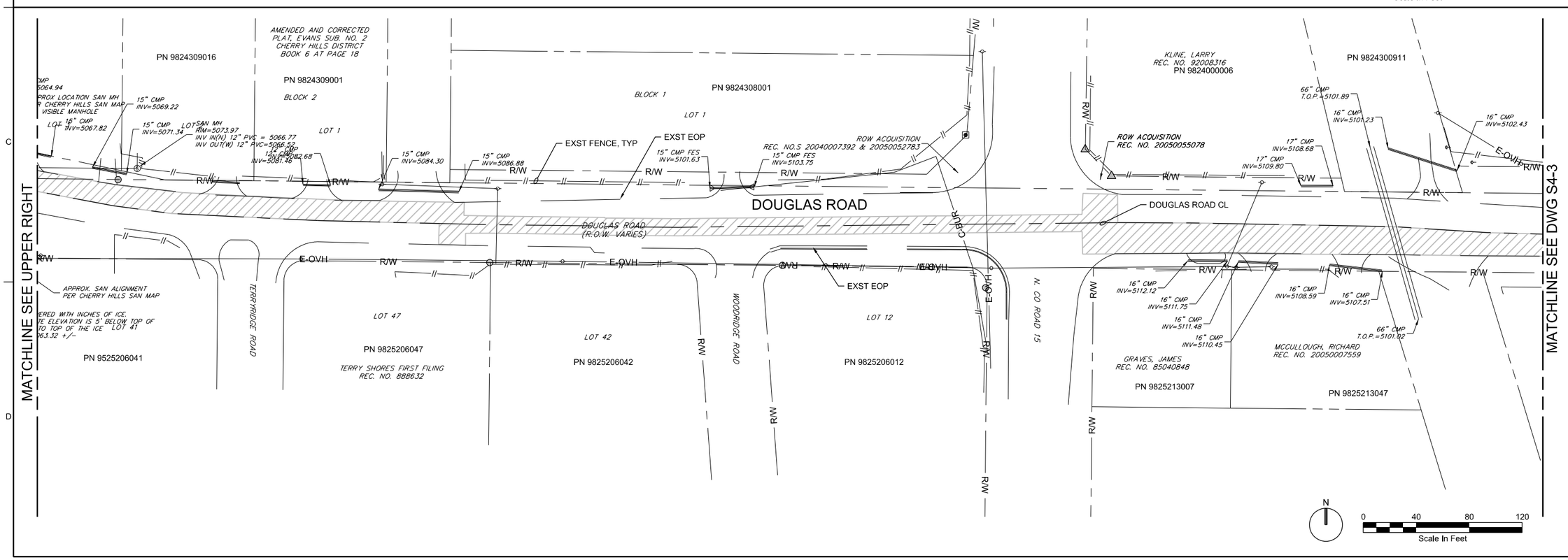
DRAWING S4-1
PAVEMENT RESTORATION PLAN

CONCEPTUAL-NOT FOR CONSTRUCTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MARCH 2018
PROJ	000181
DWG	S4-1
SHEET	of





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DRAWING S4-2
PAVEMENT RESTORATION PLAN

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0 1"

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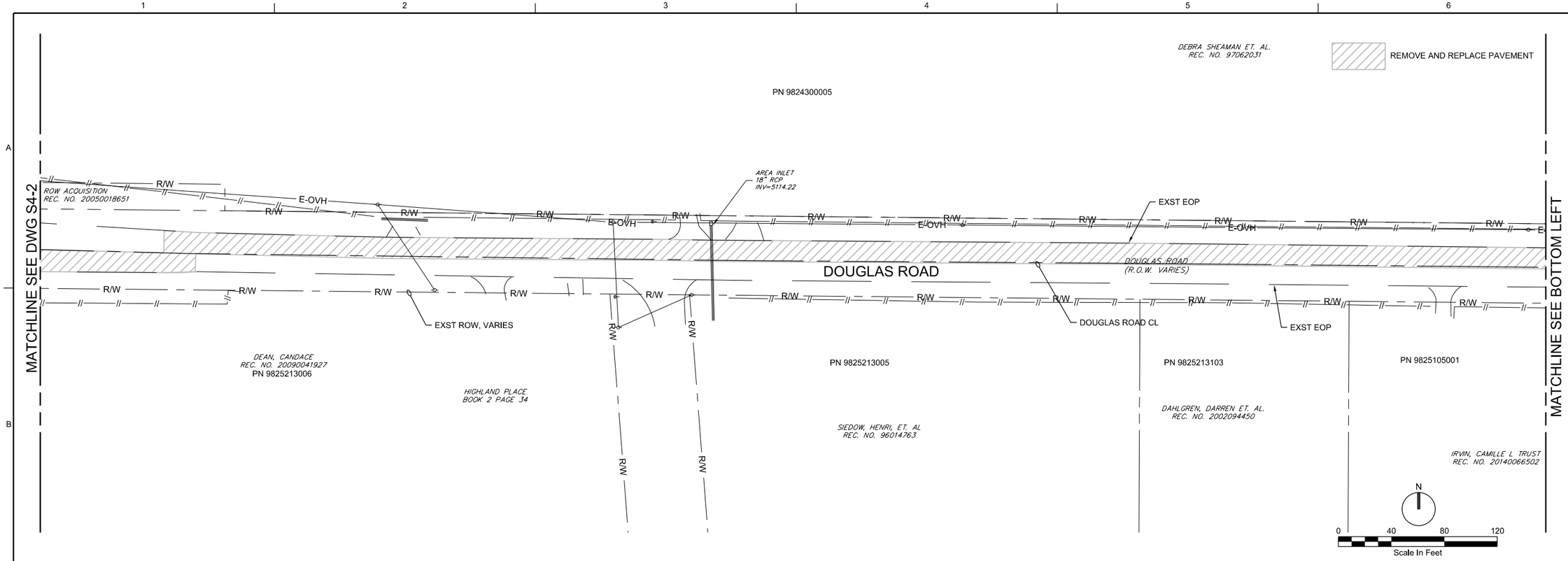
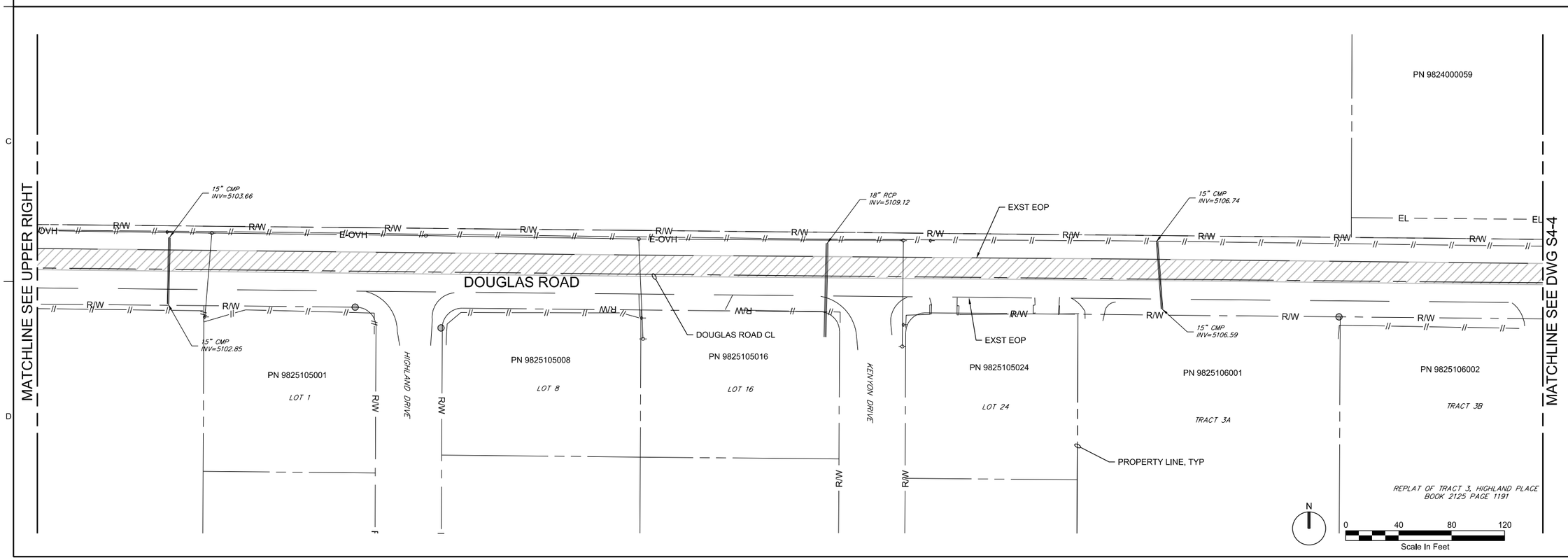
PROJ	000181
DWG	S4-2
SHEET	of





NO.	DATE	REVISION	BY	APVD

DSGN	DR	CHK	APVD
T STOUT	M MONAHAN	T STOUT	T STOUT

THORNTON WATER PROJECT
CITY OF THORNTON
THORNTON, CO

DRAWING S4-3
PAVEMENT RESTORATION PLAN

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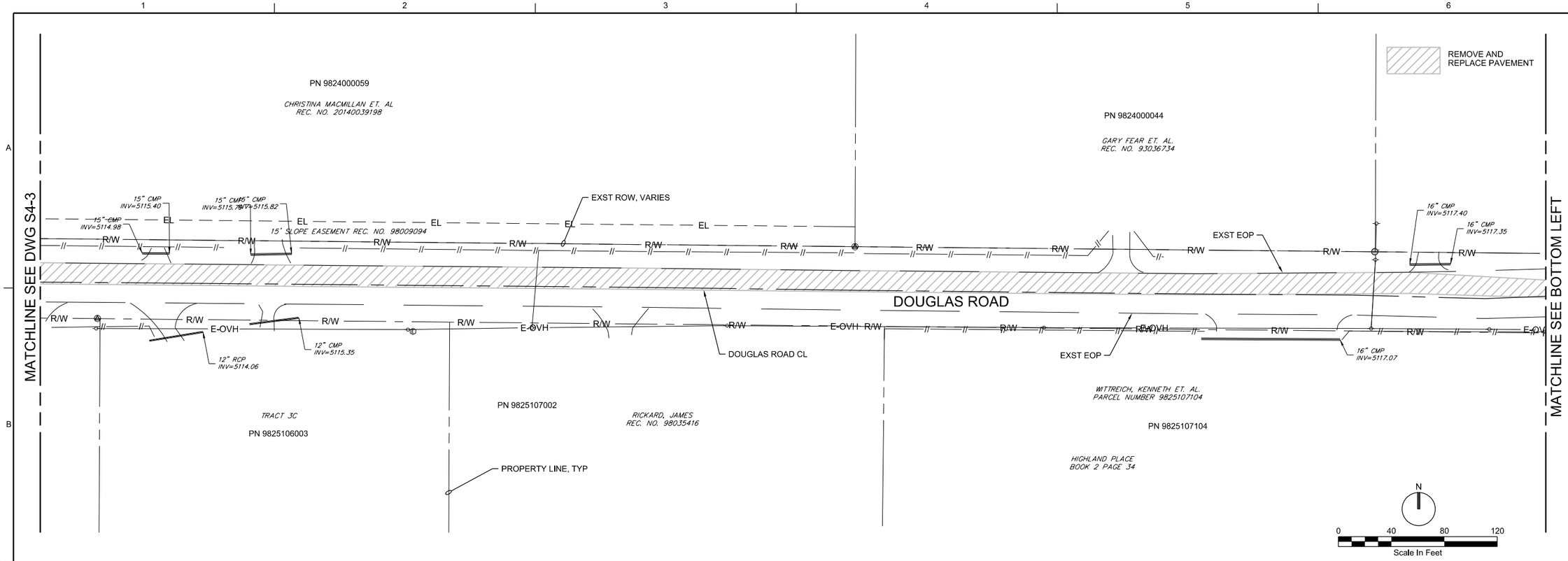

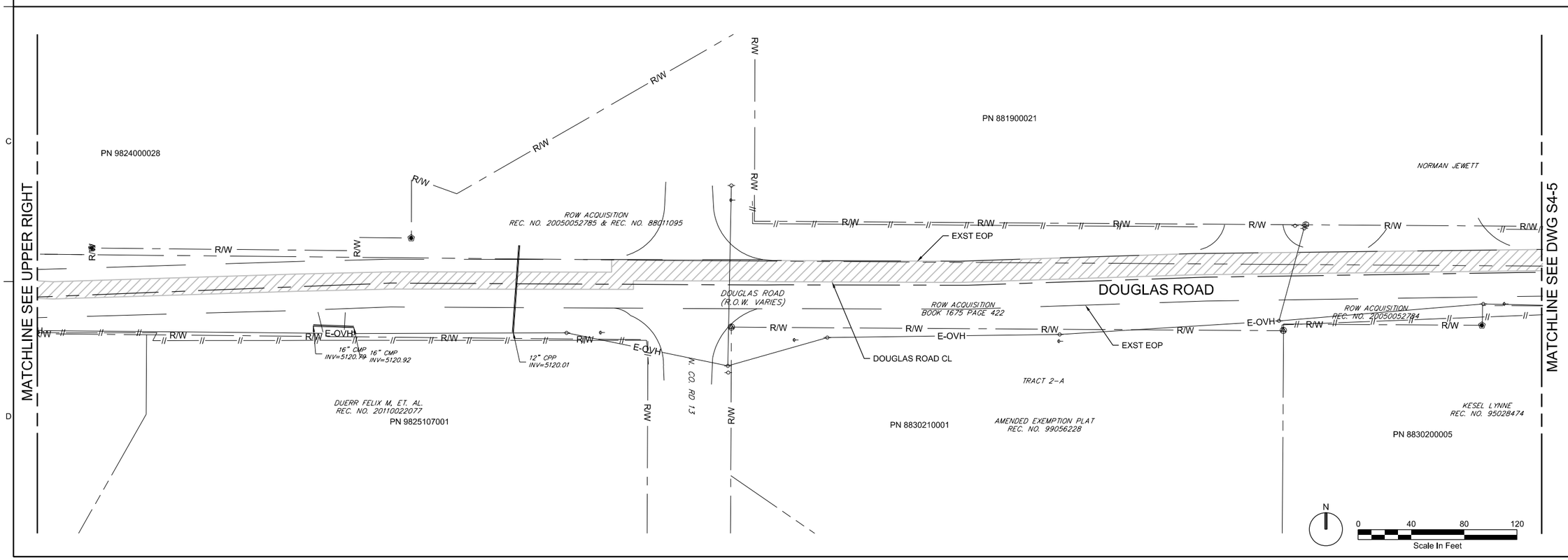

NO.	DATE	REVISION	BY	APVD

DSGN	DR	CHK	APVD
T STOUT	M MONAHAN	T STOUT	T STOUT

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CITY OF THORNTON
THORNTON, CO

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DRAWING S4-4
PAVEMENT RESTORATION PLAN

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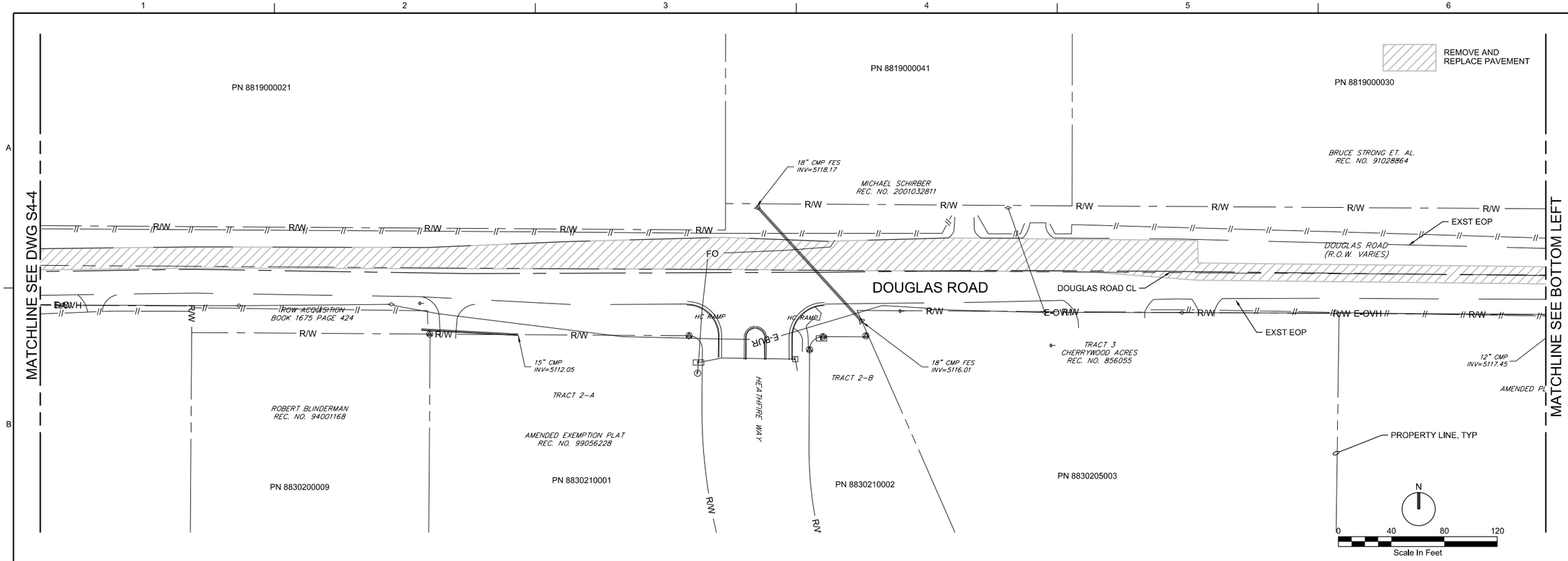

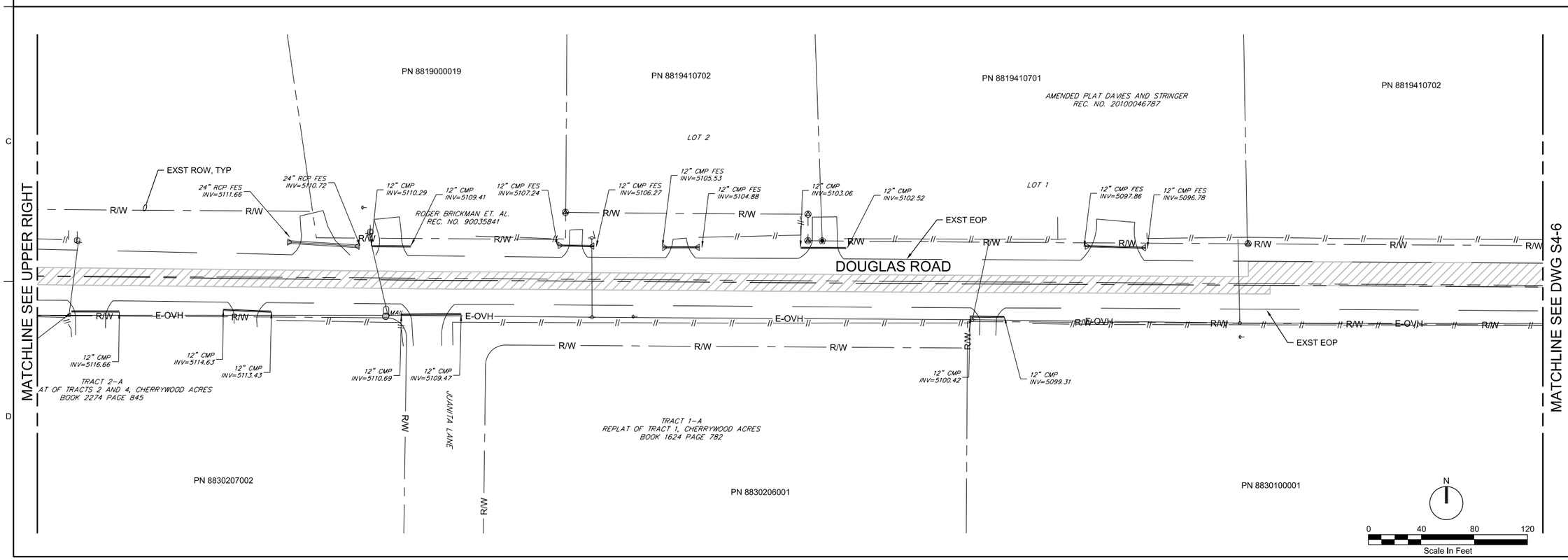

NO.	DATE	REVISION	BY	APVD

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T STOUT	M MONAHAN	T STOUT	T STOUT

THORNTON WATER PROJECT
CITY OF THORNTON
THORNTON, CO

DRAWING S4-5
PAVEMENT RESTORATION PLAN

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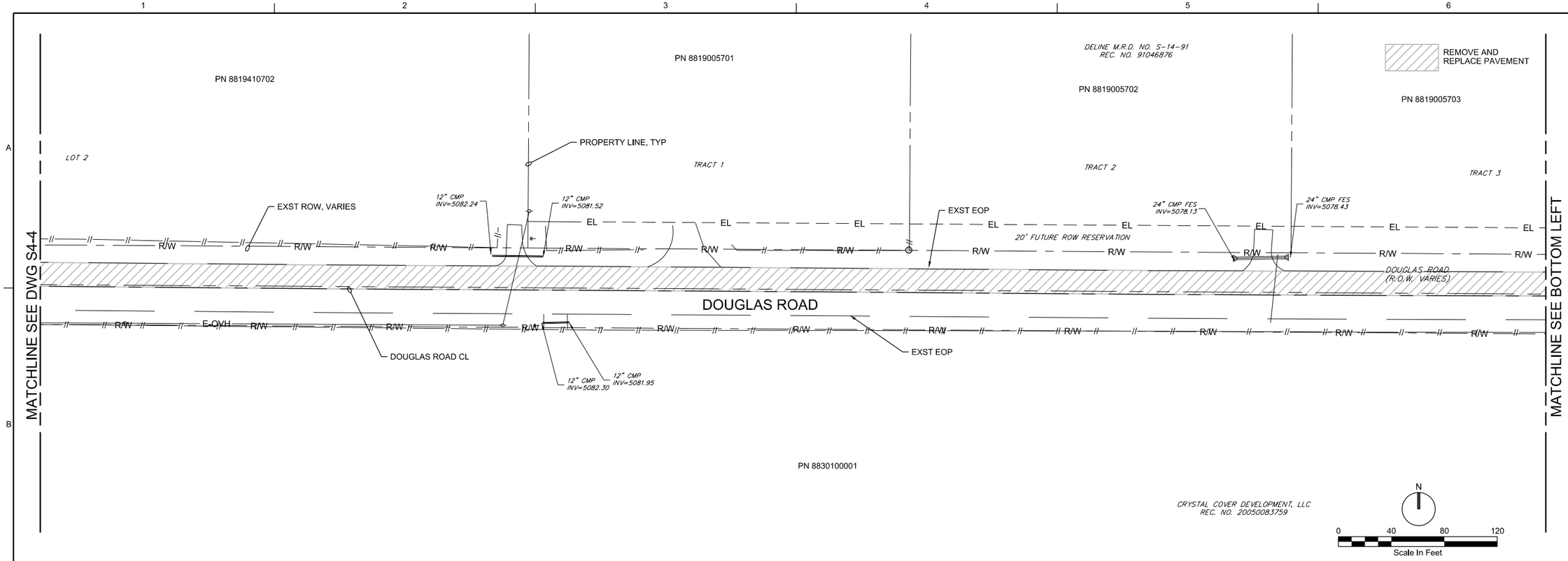

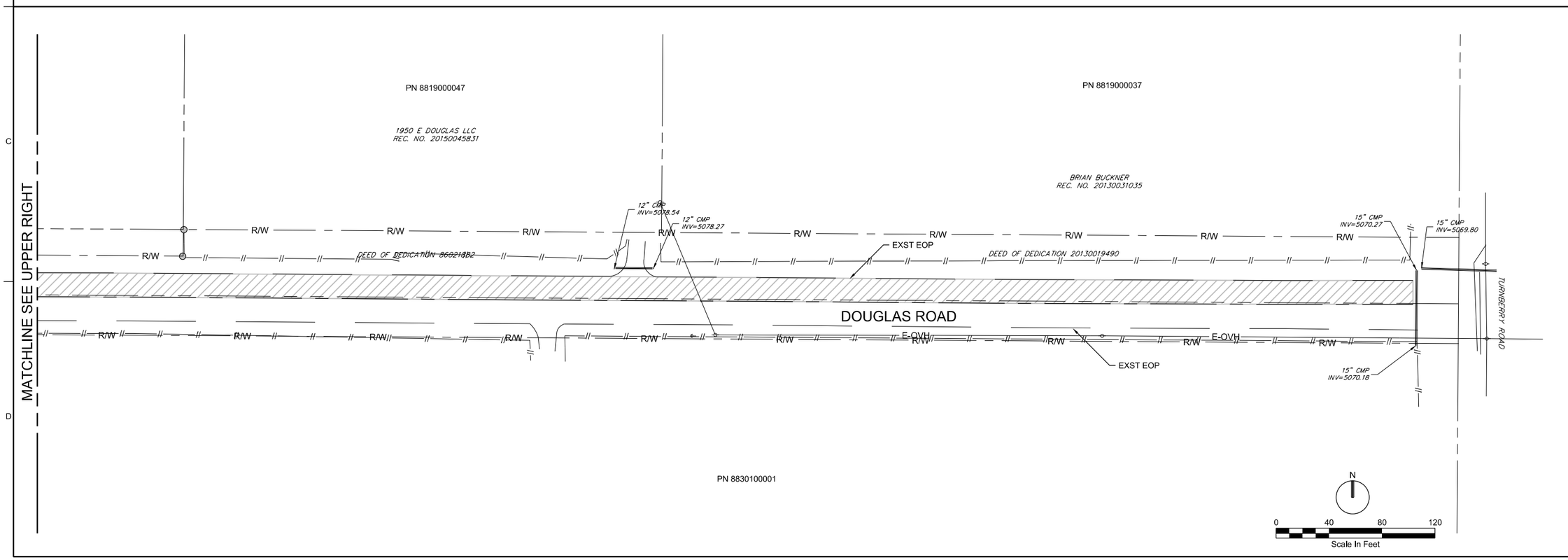

NO.	DATE	REVISION	BY	APVD

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THORNTON WATER PROJECT
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DRAWING S4-6
PAVEMENT RESTORATION PLAN

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Supplement 5 Utility Coordination

This section addresses Larimer County's request for a summary of how the TWP will coordinate and provide for utility relocation to allow for the installation of the water pipeline.

Thornton's intent is to minimize impacts to existing utilities. The TWP designer will identify if relocation of a utility is required to allow for the installation of the water pipeline. The utility owner will be contacted and approval will be obtained to relocate the utility. If relocations are required for multiple utilities/owners, Thornton and/or the TWP designer will schedule meetings and coordinate with affected utility owners concurrently. The TWP designer will design the relocation per utility owner standards or as agreed upon by both parties and per Larimer County standards as required. Thornton or the TWP designer will coordinate placement of the relocated utility with Larimer County. Review and approval of design documents will be obtained from utility owner. Any requirements for sequencing and scheduling of utility relocations will be included in the construction contract so that any service interruptions are scheduled for appropriate times and/or seasons.

Thornton will bear the costs to relocate existing utilities if relocation is required to allow for the installation of the water pipeline.

Supplement 6 Source Water Pump Station Information

This section addresses Larimer County's request for additional information regarding the source water pump station.

6.1 Parcel Number.

9823300002

6.2 Location of the pump station, on the parcel.

The conceptual source water pump station location is shown on **Figure S6-1**

6.3 General configuration of the building.

Figure S6-2 shows the conceptual floor plan for the source water pump station. In general, the source water pump station will be configured with two separate spaces, one for the mechanical equipment, and another for the electrical equipment. Approximate horizontal dimensions of the building are shown on **Figure S6-2**. The height of the building has not been determined. The height of the building will not exceed the maximum structure height allowed in accordance with LUC Section 4.0. During design, Thornton will consider input and suggestions on the design and architecture for the source water pump station that reduce the visual impacts of the facility. Thornton will submit a Site Plan Review permit application to Larimer County in accordance with LUC Section 6.0 and as part of that process, Thornton will coordinate with Larimer County to determine requirements for maximum building height, orientation, and architectural design/finishes.

6.4 Basic information, concern of the equipment operating in the building; type, output, etc.

The source water pump station mechanical room will include five 850 horsepower 10 million gallons per day vertical turbine pumps and motors (four duty and one stand-by) and two air compressors for the surge mitigation tanks (one duty and one stand-by). The electrical room will have five variable frequency drives, medium voltage switchgear, and ancillary equipment. Two air over water surge mitigation tanks (one duty and one stand-by) and a flow meter vault are anticipated to be installed underground outside the building. An emergency diesel backup generator might be located outside of the source water pump station, if a second independent power source is not included. Thornton contacted Poudre Valley Rural Electrical Association (PVREA) to determine if current infrastructure in the area supports the proposed load, and they confirmed sufficient power is available in the area to supply the source water pump station. In addition, it may be possible for PVREA to extend a second, redundant power feed to the source water pump station for emergency backup power. If a second feed is feasible and cost-effective, an emergency diesel powered backup generator will not be required. Thornton will continue to coordinate with PVREA to determine specific requirements for power service to the source water pump station.

Thornton Water Project

Thornton WATER PROJECT

CITY OF THORNTON
COLORADO

12450 WASHINGTON ST
THORNTON, CO 80241-2405

2/28/2018

N
W E
S

0 300 600 Feet

1 inch = 600 feet

River/Stream/Canal/Ditch

Source Water Pump Station Location

GMA Boundary

Fort Collins

* Final orientation of the Source Water Pump Station will be determined during design development. Thornton will submit a Site Plan Review permit application to Larimer County after design has progressed to the level necessary to submit the application.

Figure S6-1
Conceptual Source Water Pump Station Location

Sources: NHD, USGS, CDWR, Larimer County, NAIP

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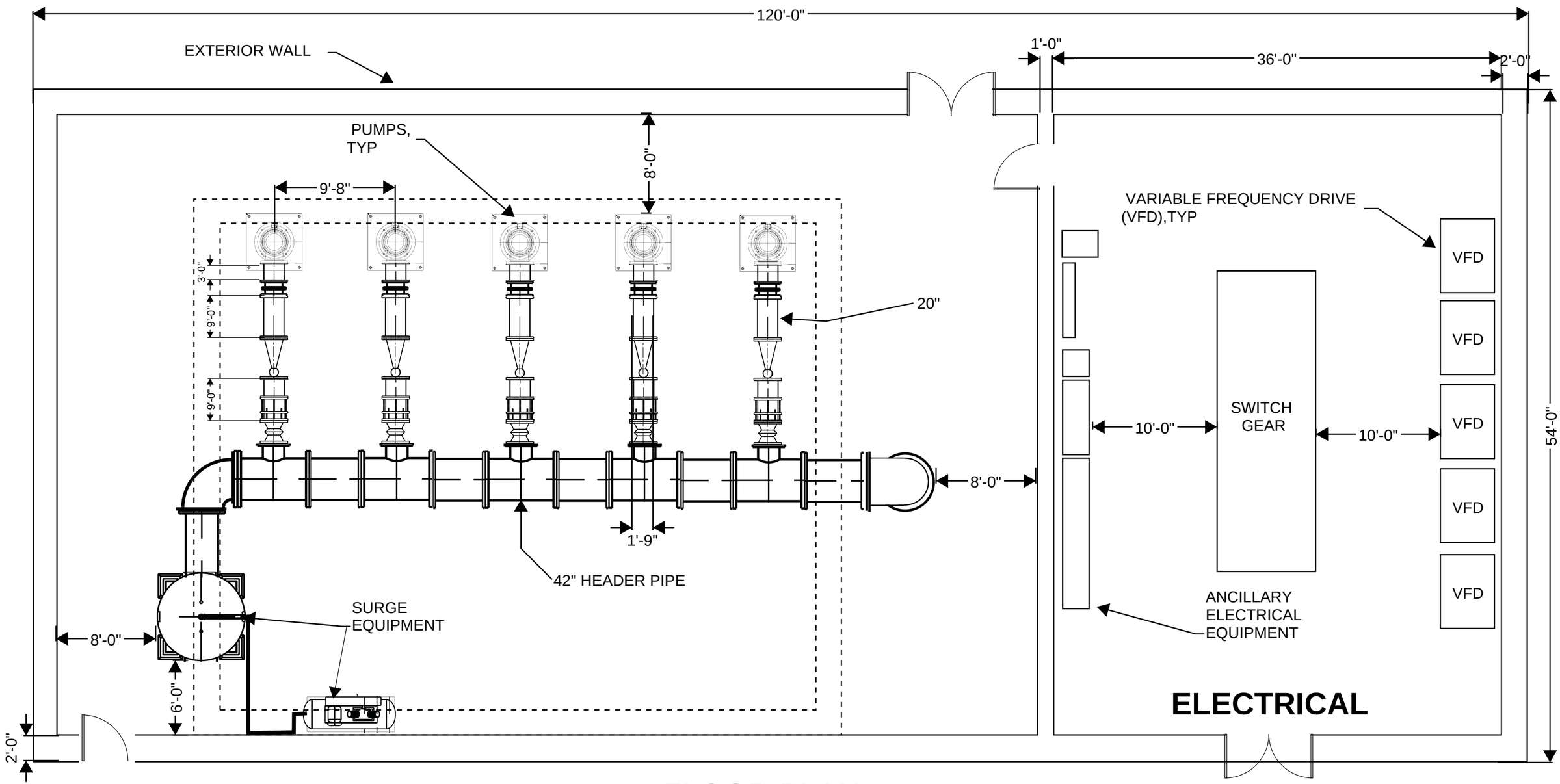
Thornton Water Project



FLOOR PLAN

CITY OF THORNTON
COLORADO
12450 WASHINGTON ST
THORNTON, CO 80241-2405

2/9/2018

Figure S6-2
Source Water Pump Station Conceptual Layout

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