Facilities Study for the Mora Line Transmission Project

Non-Tariff Facilities Study

November 2017

Work Performed by:
Public Service Company of New Mexico

Foreword

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1 Executive Summary

Public Service Company of New Mexico ("PNM") performed this Interconnection Facilities Study ("FACS") based on results from a completed non-tariff wires-to-wires interconnection system impact study dated May 2017[1]. The purpose of this Study Report is to provide cost and construction schedule estimates for the system reinforcements needed to interconnect the Mora Line Transmission Project ("MLTP"). The Mora Line Transmission Project is a transmission project that interconnects at Tri-State Generation and Transmission Association's (TSGT) Gladstone and Springer 115 kV switching stations. MLTP parallels portions of the existing TSGT 115 kV line from Springer to Storrie Lake by terminating at PNM's Arriba Unit Substation.

Figure 1 shows the Project and its general location on the transmission system.

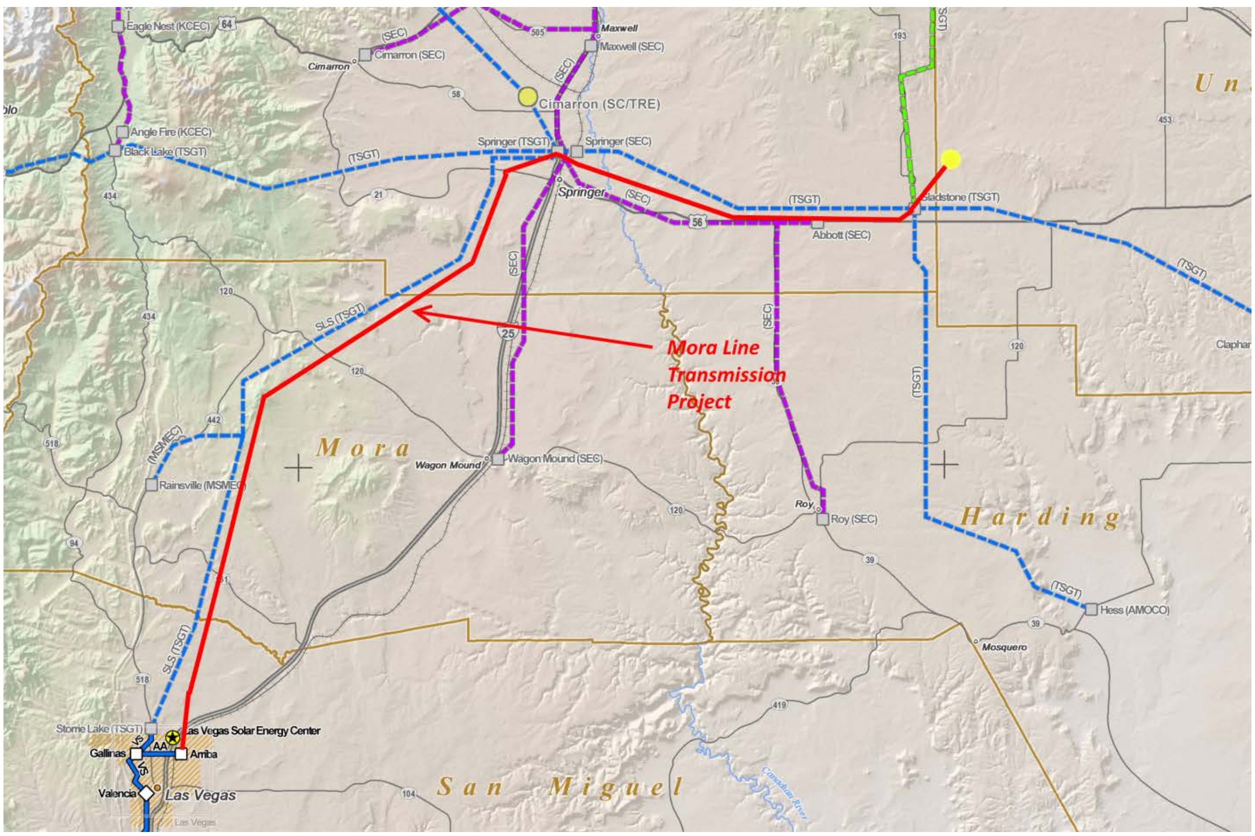

Figure 1 — Mora Line Transmission Project general location and surrounding transmission

This Study Report provides an updated list of required Network Upgrades for the interconnection of the Project, as well as the associated cost and construction schedule estimates. Section 2 of this Study

[1] http://www.oatioasis.com/pnm/index.html

Report explains the need and scope of system reinforcements. Cost and construction time estimates are summarized in Section 3 of this Study Report, and the appendix contains additional cost details.

2 Required Network Upgrades

The following transmission system reinforcements were identified in the DISIS as requirements to interconnect the Project:

- Construct a new 3 breaker ring at the intersection of the Valencia and Storrie 115 kV line and Arriba Tap 115 kV transmission line.
- Interconnect Arriba Station to MLTP via 1 115 kV breaker.

Figure 2 shows the Project and nearby transmission system.

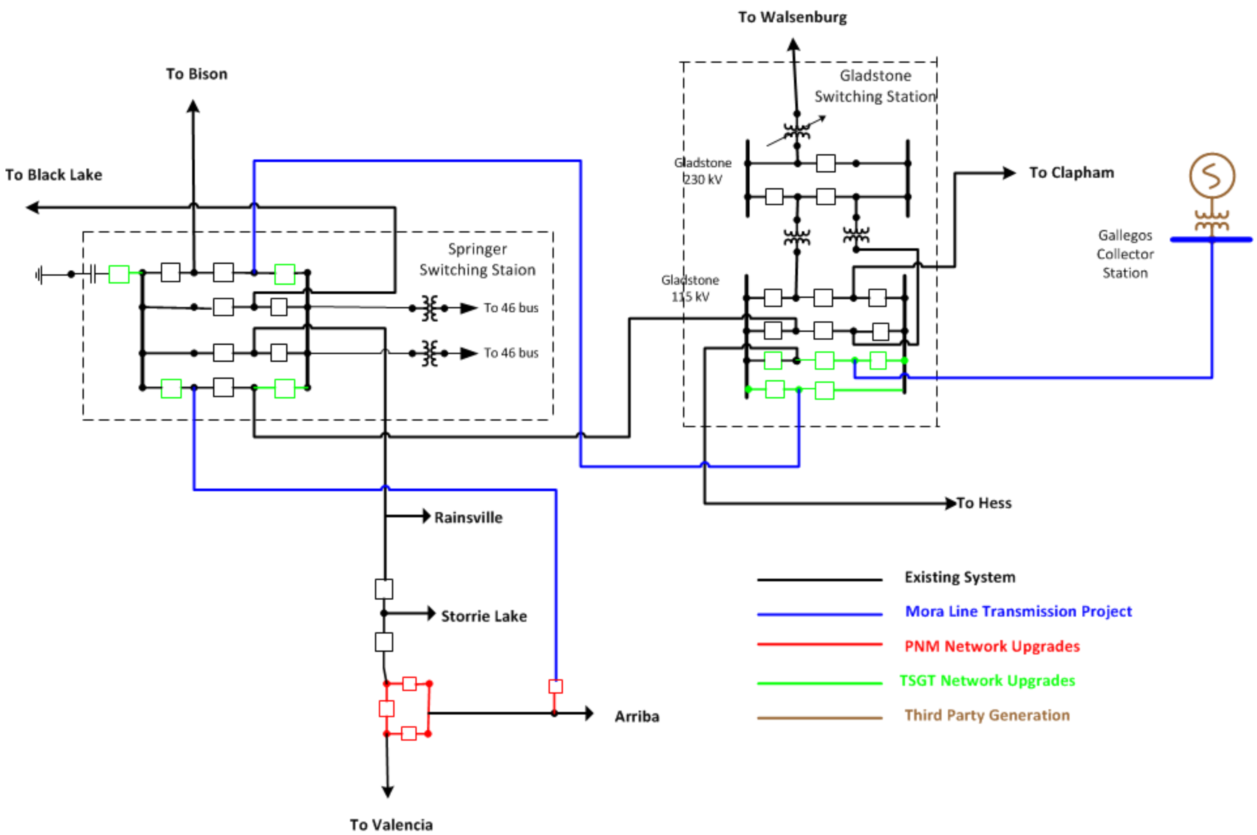

Figure 2 — Mora Line Transmission Project Interconnection and nearby PNM Transmission system

2.1 New Gallinas 115 kV Switching Station

The SIS identified the need for a new Gallinas Switching Station to interconnect the Project. Figure 3 shows the layout of the new station.

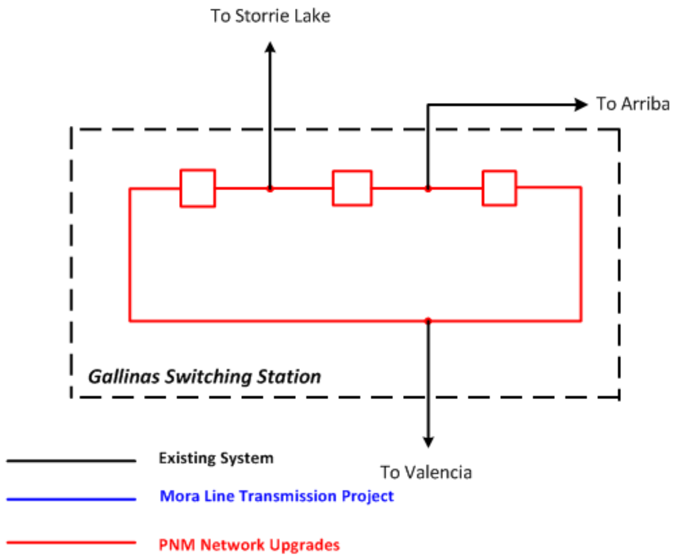

Figure 3 — Gallinas Switching Station Layout

2.2 Arriba Station Upgrade

The SIS identified the need for Arriba Station to be upgraded to accommodate the MLTP. Figure 4 shows the upgrades at Arriba Station.

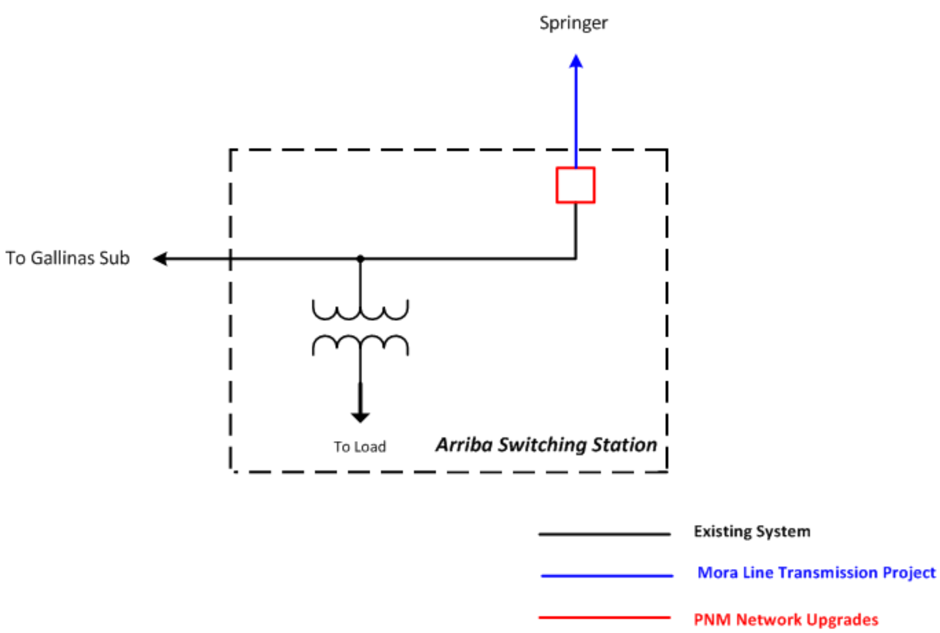

Figure 4 — Arriba Station Upgrade

3 Summary of Cost Estimate and Work Schedule

The total cost and construction schedule estimates are shown below in Table 1. Construction schedule estimates are from the date the Interconnection Customer provides written authorization to proceed, provided all interconnection agreements and funding arrangements are in place.

It is likely that PNM will incur outage costs during the construction of the identified system reinforcement. The cost of construction outages cannot be estimated at this time. However, in accordance with applicable Federal Energy Regulatory Commission Policy, PNM reserves the right to recover such costs from the Interconnection Customer.

Additional cost estimate details are contained in Appendix A.

Table 1 — Mora Line Transmission Project Cost Estimate

TPIF + Network Upgrades Required		
	IA-PNM-2014-08	
TRANSMISSION NETWORK UPGRADE	COST ($M)	CONSTRUCTION TIME
Construct a new 3 breaker ring at the intersection of the Valencia and Storrie 115 kV line and Arriba Tap 115 kV transmission line.	10.9	18 months
Interconnect Arriba Station to MLTP via 1 115 kV breaker.	3.4	18 months
Transmission Providers Interconnection Facilities (TPIF)	0.7	18 months
Total	**15.0**	**18 months**

The following general assumptions apply to all PNM cost estimates and schedules:

1. For all estimates, pricing is based on 2017 unit costs. With likely fluctuations in the price of raw materials, fuel, and labor, actual costs may vary in future years. Pricing is based upon current conceptual design assuming land is provided by Interconnection Customer for Valencia station.
2. Estimates include governmental permitting, design, materials, construction, construction management, and internal utility loads.
3. Project schedules are considered reasonably accurate but can be affected by permitting delays, extended land negotiations, equipment deliveries, weather, availability of workforce, and availability of outage clearance for construction.
4. Barring unforeseen complications with local permitting requirements, availability of system outages, strikes, resource limitations etc., the proposed schedule for final design and construction is estimated to take 18 months from PNM's receipt of written authorization to begin work.

Appendix A contains an itemized cost estimate as well as specific assumptions used in preparing the cost estimate.

Major activities are presented in the construction schedule estimate below. The schedule is representative of typical project timelines and activities, and will be revised as the Project details become firm.

Table 2 — Mora Line Transmission Project Interconnection Schedule

	Mora Line Transmission Project - Interconnection Schedule																	
	Elapsed Months																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	14	16	17	18
Notice to Proceed																		
bid/award design																		
Design																		
Material/Equipment Order&Delivery																		
bid/award construction																		
construction site grading																		
construction mechanical																		
construction controls																		
construction testing/commissioning																		
Station in-service																		X

dependent upon:
timely receipt of complete design information
availability of outages
ability to expand the station pad to the north
material lead time

Appendix A: Cost Estimate Detail

Table 3 — Total Mora Line Transmission Project Cost Detail

Mora Line Transmission Project			
TOTAL NETWORK UPGRADES BREAKDOWN			
PROJECT SCHEDULE TASK	LABOR/ SERVICES	MATERAL	TOTAL COST
Station Design & Construction	$ 5,638,830	$ 2,865,114	$ 8,503,943
Site Development	$ 90,001	$ -	$ 90,001
Regulatory/Permitting/Enviromental	$ 334,831	$ -	$ 334,831
Controls, Comunications and Protection	$ 1,057,384	$ 133,500	$ 1,190,884
Transmission Providers Interconnection Faclities (TPIF)			
Metering, Protection & Control , Comm	$ 286,902	$ 221,700	$ 508,602
Sub - Total Cost	$ 7,407,947	$ 3,220,314	$ 10,628,261
Contengency @ 10%	$ 740,795	$ 322,031	$ 1,062,826
A&G @ 3.36%	$ 248,907	$ 108,203	$ 357,110
E&S @ 8.25%	$ 611,156	$ 265,676	$ 876,832
NM Gross Receipts Taxes @ 8.3958%	$ 621,956	$ 270,371	$ 892,328
Pre-AFUDC Total	$ 9,630,761	$ 4,186,595	$ 13,817,356
AFUDC @ 5.47% (18 months) *	$ 790,203.93	$ 343,510.09	$ 1,133,714
Total Project Cost	$ 10,420,965	$ 4,530,105	$ 14,951,070

Notes and Assumptions:

1. * AFUDC can be avoided by the Interconnection Customer if they make monthly payments during construction.
2. Mitigation for any environmental/cultural issues is not included.
3. PNM may elect to contract any or all parts of the project.
4. This design is in accordance with PNM's Breaker Configuration Policy.
5. The project schedule is based on having all permits, agreements, and authorizations completed prior to initiation of construction work.
6. Pricing is based on current PNM equipment standards and station design.
7. Communication assumptions assume the use of Fiber and Microwave networks.
8. Station backup power is assumed to be from local distribution station and a 115 kV SSVT.

Table 4 — Gallinas Switching Station Cost Detail

Gallinas Switching Station			
NETWORK UPGRADES BREAKDOWN			
PROJECT SCHEDULE TASK	LABOR/ SERVICES	MATERAL	TOTAL COST
Station Design & Construction	$ 4,556,231	$ 2,011,658	$ 6,567,888
Site Development	$ 90,001	$ -	$ 90,001
Regulatory/Permitting/Enviromental	$ 254,831	$ -	$ 254,831
Controls, Comunications and Protection	$ 820,884	$ -	$ 820,884
Sub - Total Cost	$ 5,721,946	$ 2,011,658	$ 7,733,604
Contengency @ 10%	$ 572,195	$ 201,166	$ 773,360
A&G @ 3.36%	$ 192,257	$ 67,592	$ 259,849
E&S @ 8.25%	$ 472,061	$ 165,962	$ 638,022
NM Gross Receipts Taxes @ 8.3958%	$ 480,403	$ 168,895	$ 649,298
Pre-AFUDC Total	$ 7,438,862	$ 2,615,272	$ 10,054,134
AFUDC @ 5.47% (18 months) *	$ 610,359	$ 214,583	$ 824,942
Total Project Cost	$ 8,049,220	$ 2,829,855	$ 10,879,075

* AFUDC can be avoided by the Interconnection Customer if they make monthly payments during construction.

Table 5 — Arriba Switching Station

Arriba Switching Station						
NETWORK UPGRADES BREAKDOWN						
PROJECT SCHEDULE TASK	LABOR/ SERVICES		MATERAL		TOTAL COST	
Station Design & Construction	$	1,082,599	$	853,456	$	1,936,055
Site Development	$	-	$	-	$	-
Regulatory/Permitting/Enviromental	$	80,000	$	-	$	80,000
Controls, Comunications and Protection	$	236,500	$	133,500	$	370,000
Sub - Total Cost	$	1,399,099	$	986,956	$	2,386,055
Contengency @ 10%	$	139,910	$	98,696	$	238,606
A&G @ 3.36%	$	47,010	$	33,162	$	80,171
E&S @ 8.25%	$	115,426	$	81,424	$	196,850
NM Gross Receipts Taxes @ 8.3958%	$	117,466	$	82,863	$	200,328
Pre-AFUDC Total	$	1,818,910	$	1,283,100	$	3,102,010
AFUDC @ 5.47% (18 months) *	$	149,242	$	105,278	$	254,520
Total Project Cost	$	1,968,151	$	1,388,378	$	3,356,530

* AFUDC can be avoided by the Interconnection Customer if they make monthly payments during construction.

Table 6 breaks out Transmission Provider Interconnection Facilities (TPIF) Costs that are subset of the total cluster cost estimate, itemized below, for the purposes of creating a Interconnection Agreement (IA) which is the next step once this report is finalized with the interconnection customer.

Table 6 — Arriba Station Metering, Protection, Controls and Communications Detail.

METERING, PROTECTION, CONTROLS AND COMMUNICATIONS DETAIL			
ARRIBA SWITCHING STATION DETAIL			
Item Description	**Total Equip & Material Cost**	**Total Labor Cost**	**Total Labor Material & Equipment**
Metering/Protection/Controls Equipment & Labor	$ 167,700	$ 220,902	$ 388,602
Communications Equipment Matls & Labor	$ 54,000	$ 66,000	$ 120,000
Sub-Total Transmission Provider Interconnection Facilities-Base Cost Es	$221,700	$286,902	$508,602
Contengency @ 10%	$22,170	$28,690	$50,860
A&G @ 3.36%	$7,449	$9,640	$17,089
E&S @ 8.25%	$18,290	$23,669	$41,960
NM Gross Receipts Taxes @ 8.3958%	$18,613	$24,088	$42,701
Pre-AFUDC	$288,223	$372,989	$661,212
AFUDC @ 5.47% (18 months) *	$23,649	$30,604	$54,252
TOTAL Transmission Provider Interconnection Facilities Cost Est	$311,872	$403,593	$715,465

* AFUDC can be avoided by the Interconnection Customer if they make monthly payments during construction.

Appendix B: Proposed Station Layouts

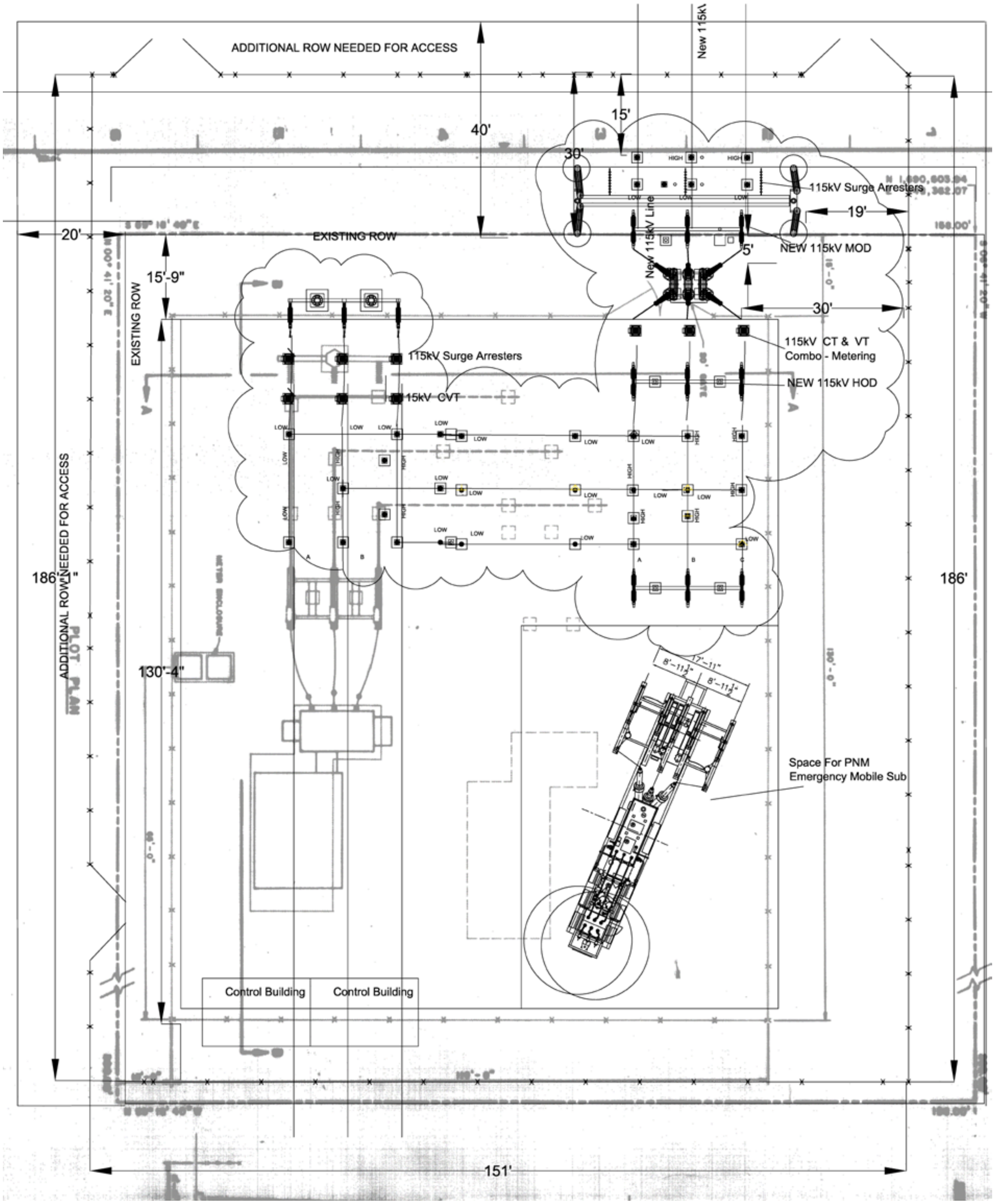

Figure 5 — Arriba Station Proposed Layout

Layout assumed for Facilities Study estimate purposes only. Actual design will be determined when the project is transitioned to construction.

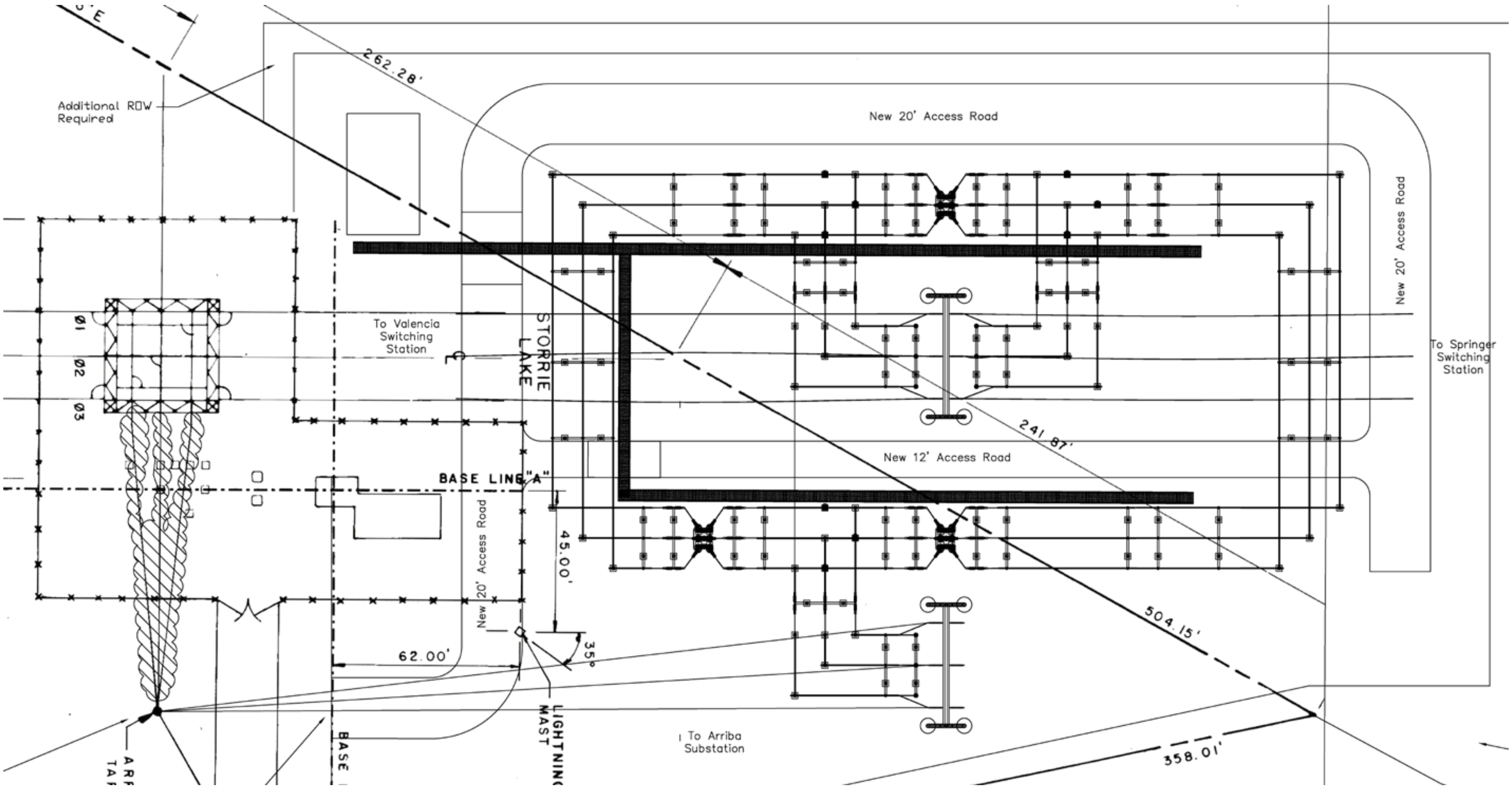

Figure 6 — Gallinas Switching Station proposed layout

Layout assumed for Facilities Study estimate purposes only. Actual design will be determined when the project is transitioned to construction.