

Section 9 Sampling Strategy

9.1 Excavation Sampling Strategy

The proposed sampling strategy consists of forty (40) test trenches within the 9.06-acre project footprint (Table 10, Figure 53 to Figure 82). In general, the planned archaeological subsurface test excavations are distributed throughout the study area to provide representative coverage and assess the stratigraphy and potential for subsurface cultural resources for the entire area of Construction Phase 3. The proposed sampling strategy was developed in consideration of the following:

- Sediment types
- Natural geographic features
- Background research, including information from historic maps and Land Commission Awards (LCA) documents
- Results of previous archaeological studies in the vicinity
- Results of consultation with the Native Hawaiian community
- Assessment of the impact of prior land development
- Consideration of safety concerns for actually carrying out the archaeological work

The majority of the proposed test trenches are located within the footprint of proposed column foundations. A total of twenty-four (24) column foundation test trenches are spread throughout the project area. Additionally, one test trench is located in the area of utility relocation within the vicinity of the Pearl Harbor Naval Base Station (Figure 58).

Subsurface testing is also focused on the three transit station locations within Construction Phase 3 due to the relatively high density of subsurface impacts related to the stations' construction and also because the stations would be problematic to relocate owing to geographical and engineering constraints (see Figure 59, Figure 70, and Figure 77). A total of fifteen (15) proposed test trenches are located within the footprints of the three transit stations: Pearl Harbor Naval Base Station; Honolulu International Airport Station; and Lagoon Drive Station. Five test trenches are proposed for each of the three stations.

Additional testing may be warranted in areas adjacent to any test trench where significant cultural resources are identified. The extent of additional testing will be made in consultation with SHPD

The greatest factors limiting the survey effort are as follows:

- The survey area's large (9.06 acres), dispersed (4.8 miles) area
- The survey area's highly developed and highly active setting (in-use city streets, sidewalks, and buildings)
- The dense, complex array of existing subsurface utilities in the survey area

Table 10. Sampling Strategy

Map Sheet (J) #	Proposed Excavations	Comments
4 (near Kalaoa Street)	Two 20x2 excavations at column foundations @ 994+40 & 996+70	Close to N. side Hālawā Stream & LCA
5 (near Hālawā Drive)	Two 10x3 excavations at column foundations @ 1003+60 <i>mauka</i> of two & 1004+90	Close to S. side Halawa Stream
6	None	Constraints: Columns in middle of highway
7	None	Constraints: Columns in middle of highway
8	One 10x3 excavations at <i>mauka</i> column foundation @ 1032+40	Near Southeast Loch of Pearl Harbor
9 (near Radford Drive)	One 20x2 excavation at utility relocation (24" storm drain) @ 1043+90 (see Station discussion below)	Constraints: Columns in middle of highway
9 Pearl Harbor Naval Base Station (east of Radford Drive)	Five 20x2 test trenches	Transit Station near Southeast Loch of Pearl Harbor
10 (near Center Drive)	One 10x3 excavation at column foundation @ 1056+50	Constraints: Columns in middle of highway
11 (near Makai Frontage Road)	One 10x3 excavation at <i>makai</i> column foundation @ 1063+00	Constraints: Columns in middle of highway
12	One 10x3 excavation at column foundation @ 1077+80	
13	Two 10x3 column foundation excavations @ 1083+00 & (<i>mauka</i>) 1089+00	
14	One 10x3 excavation at column foundation @ 1099+50	
15	One 10x3 excavation at column foundation @ 1105+20	
16	One 10x3 excavation at (<i>makai</i>) column foundation @ 1115+30	
17	One 10x3 excavation at column foundation @ 1124+ 30	

Map Sheet (J) #	Proposed Excavations	Comments
18	One 10x3 excavation at column foundation @ 1134+ 30	
19	None (see Station discussion below)	
19 Honolulu International Airport Station	Five 20x2 test trenches	Transit Station
20	Two 10x3 column foundation excavations @ 1151+60 & 1159+70 (<i>makai</i>)	
21	One 10x3 excavation at (<i>makai</i>) column foundation @ 1162+50	
22	None	
23	One 10x3 excavation at (<i>makai</i>) column foundation @ 1184+20	
24	One 10x3 excavation at (<i>makai</i>) column foundation @ 1194+50	
25	None (see Station discussion below)	
25 Lagoon Drive Station	Five 20x2 test trenches	
26	Two 10x3 excavations at column foundations @ 1215+50 & 1218+20	
27	One 10x3 excavation at column foundation @ 1226+50	
28	None	All fill land over traditional coastal waters, currently surrounding the modern mouth of Moanalua Stream
29	One 10x3 excavation at column foundation @ 1247+50	

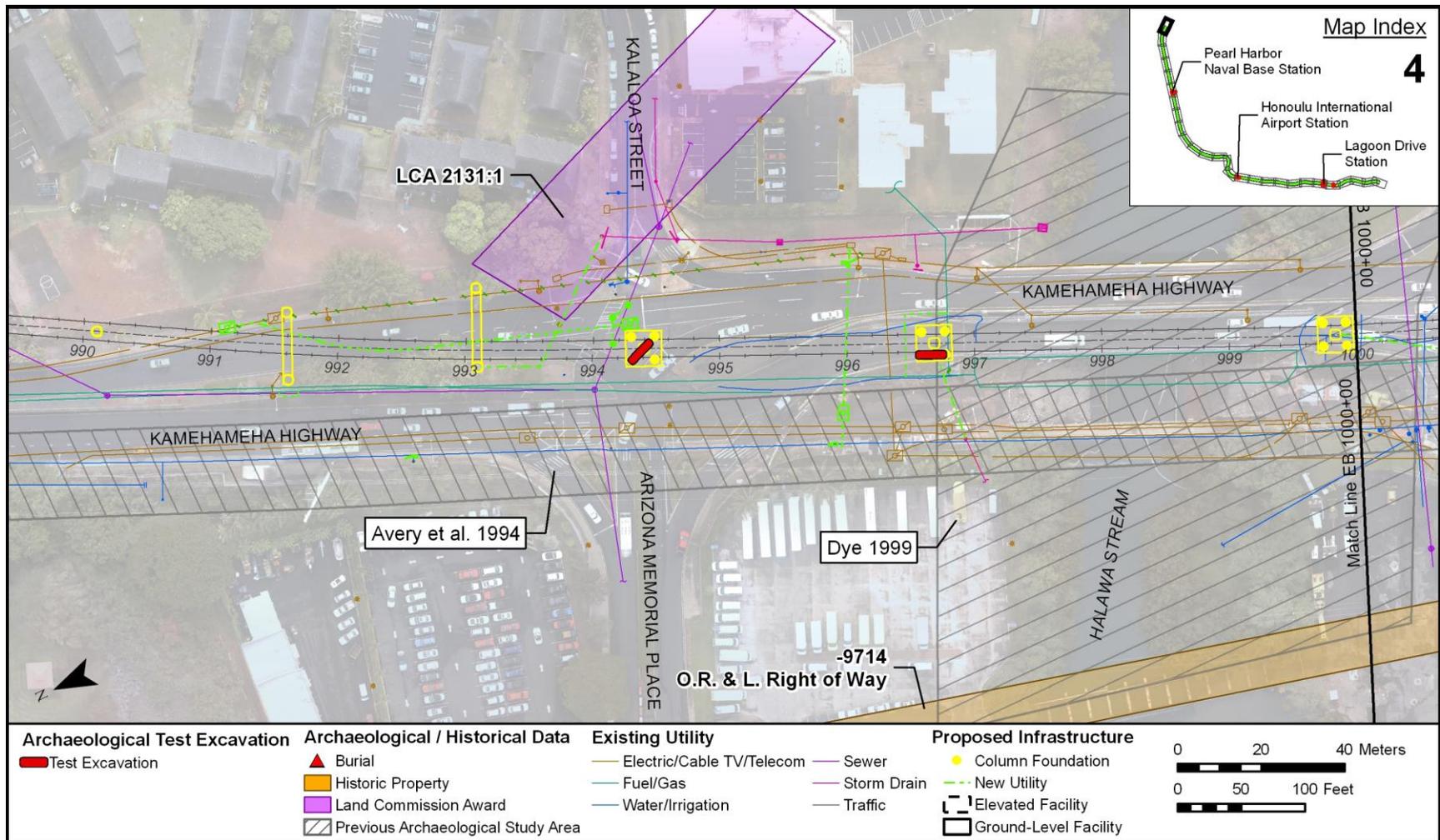


Figure 53. Map Sheet J 4 (near Kalaoa Street), two 20x2 excavations at column foundations @ 994+40 & 996+70

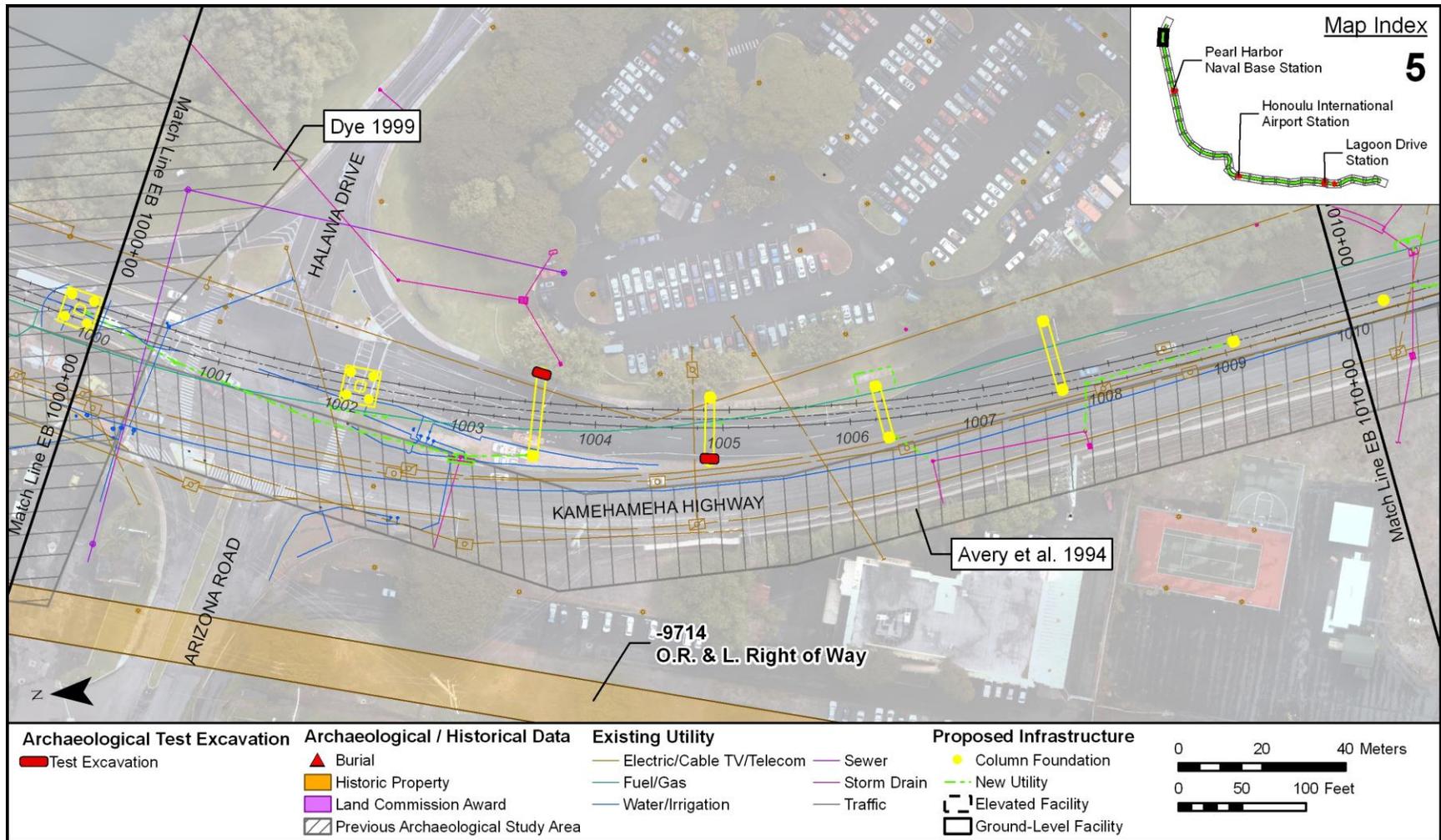


Figure 54. Map Sheet J 5 (near Hālawa Drive), two 10x3 excavations at column foundations @ 1003+60 mauka of two & 1004+90

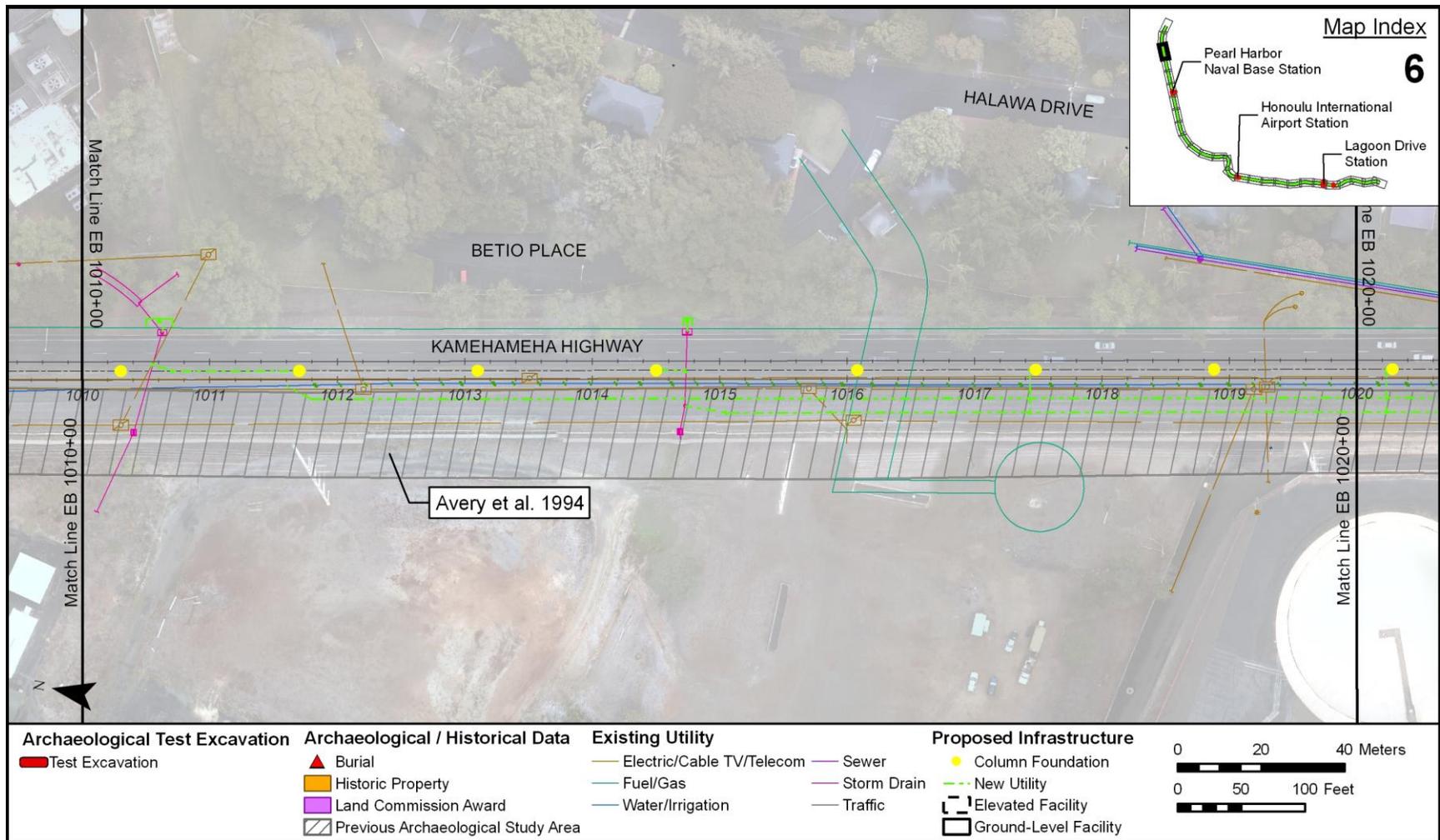


Figure 55. Map Sheet J 6, no testing (traffic constraints)

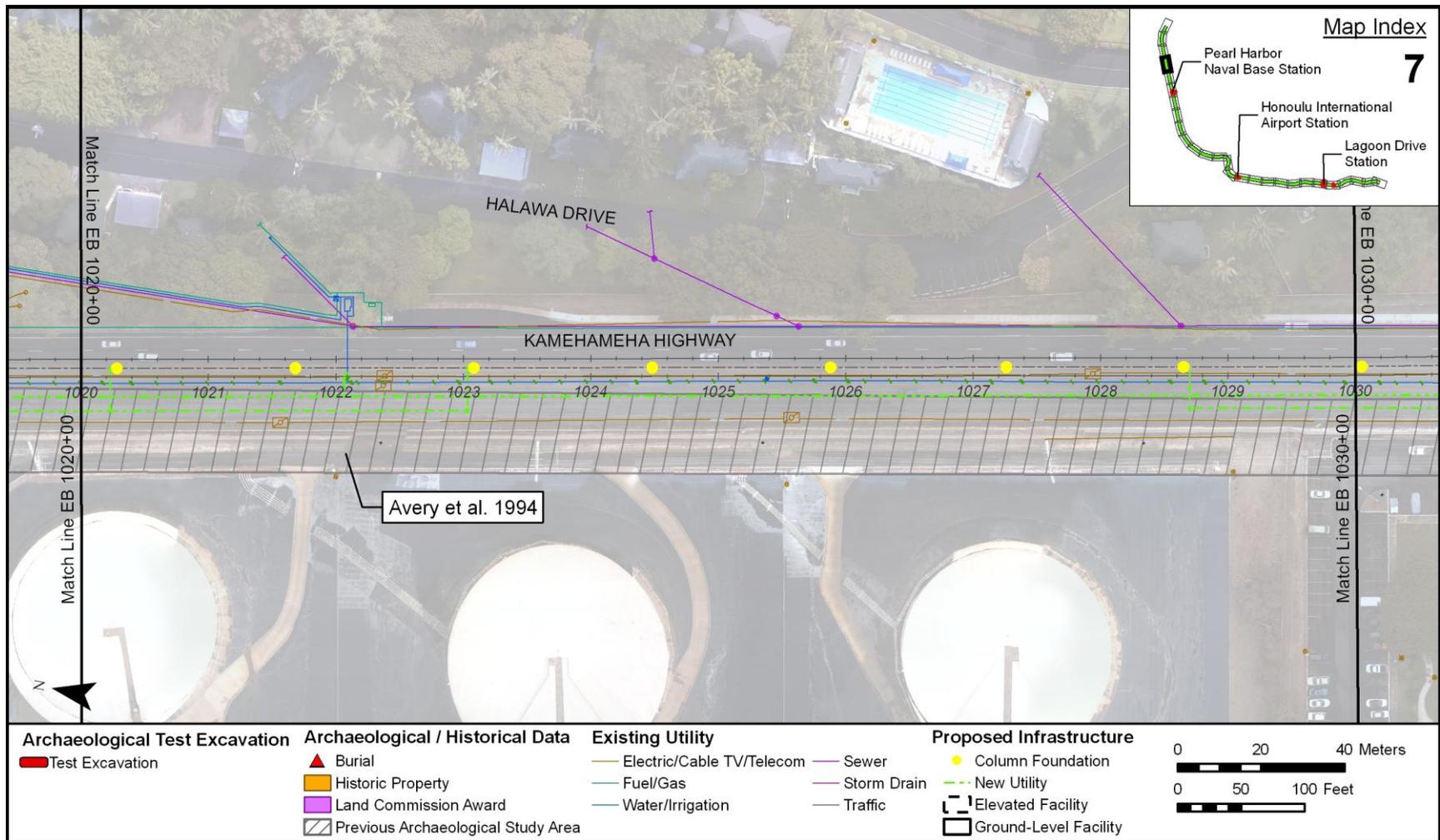


Figure 56. Map Sheet J 7, no testing (traffic constraints)

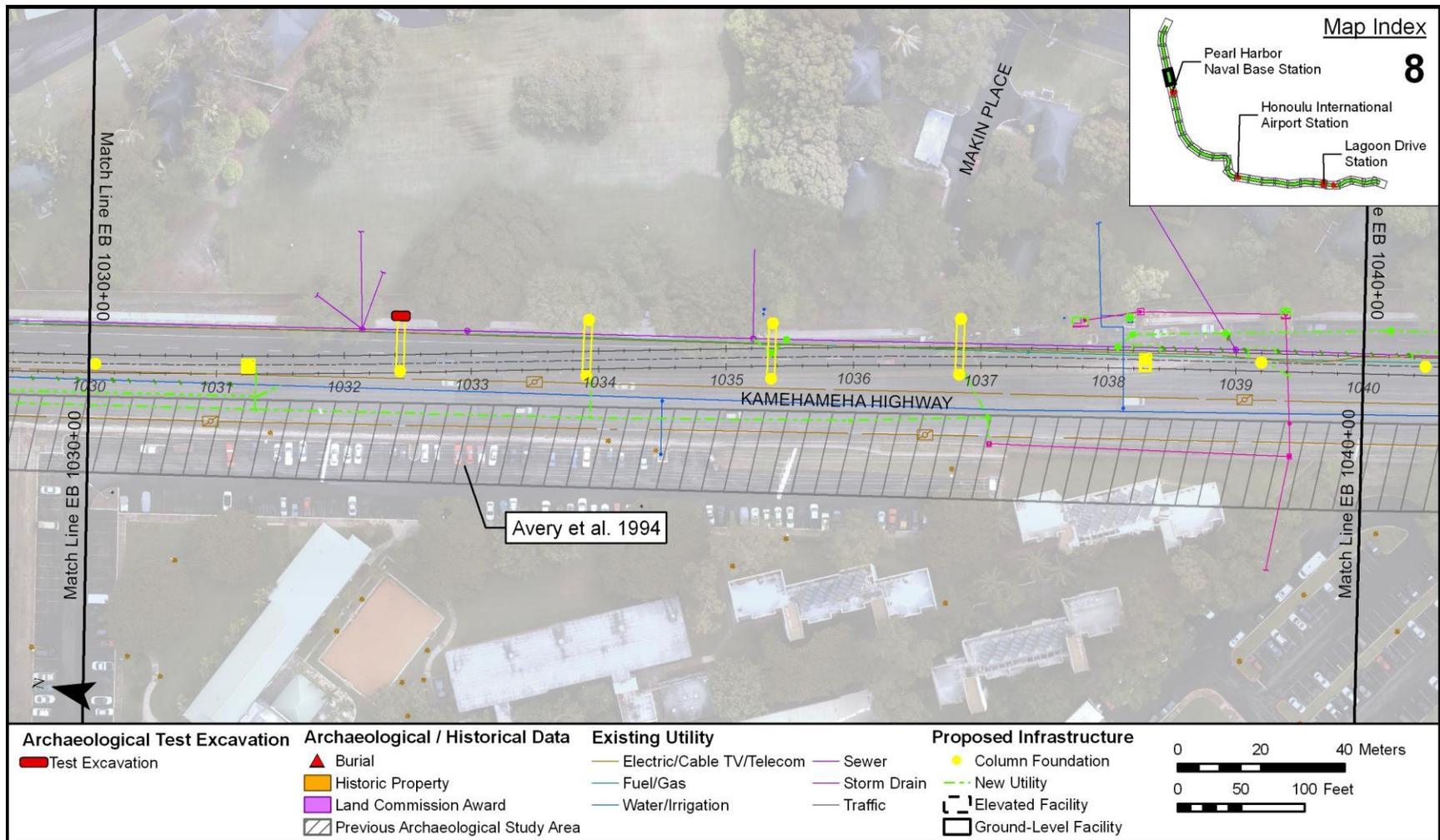


Figure 57. Map Sheet J 8, one 10x3 excavations at mauka Column foundation @ 1032+40

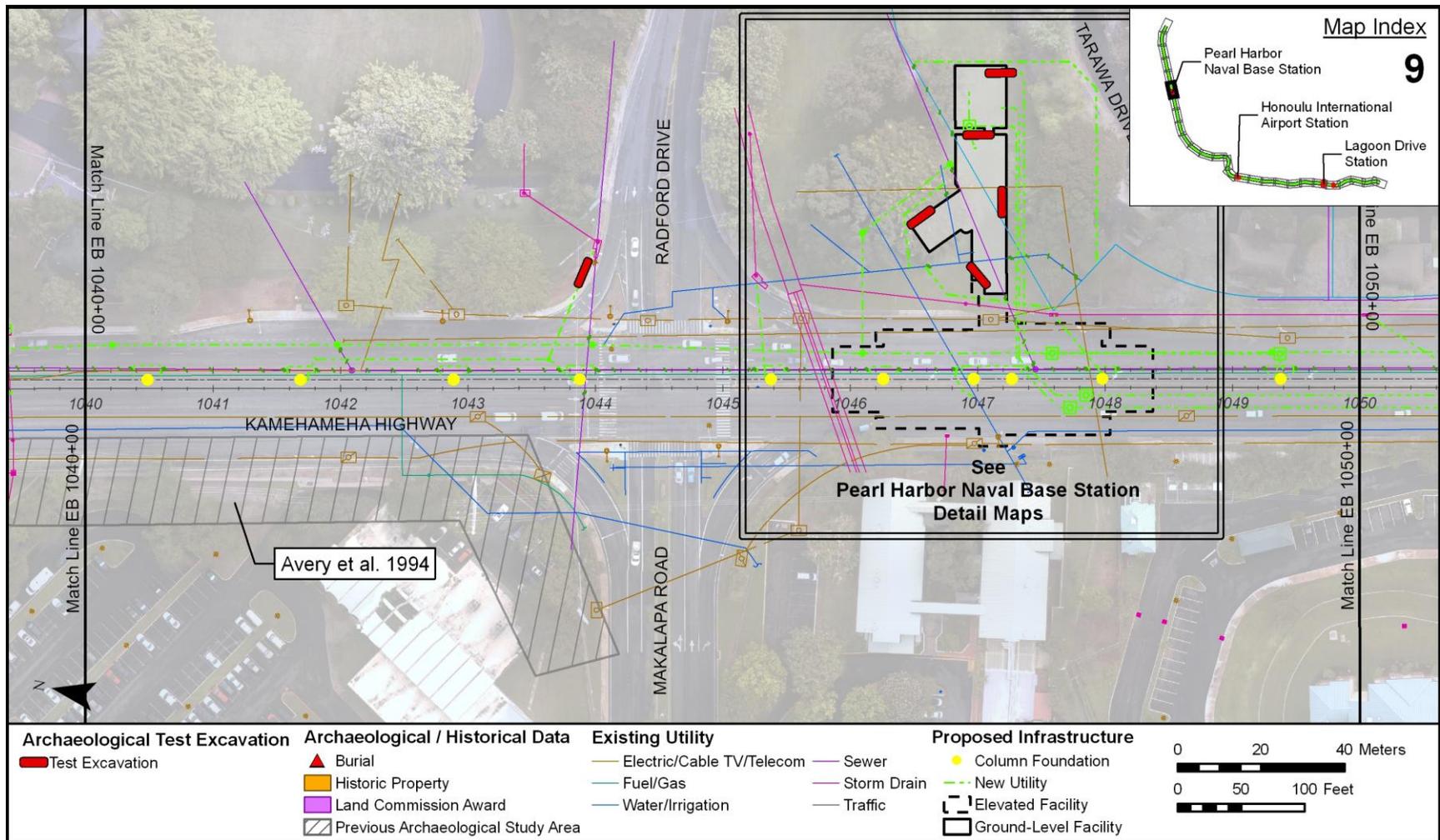


Figure 58. Map Sheet J 9 (near Radford Drive), one 20x20 excavation at utility relocation (24” storm drain) @ 1043+90 (see Station testing layout on following figure)

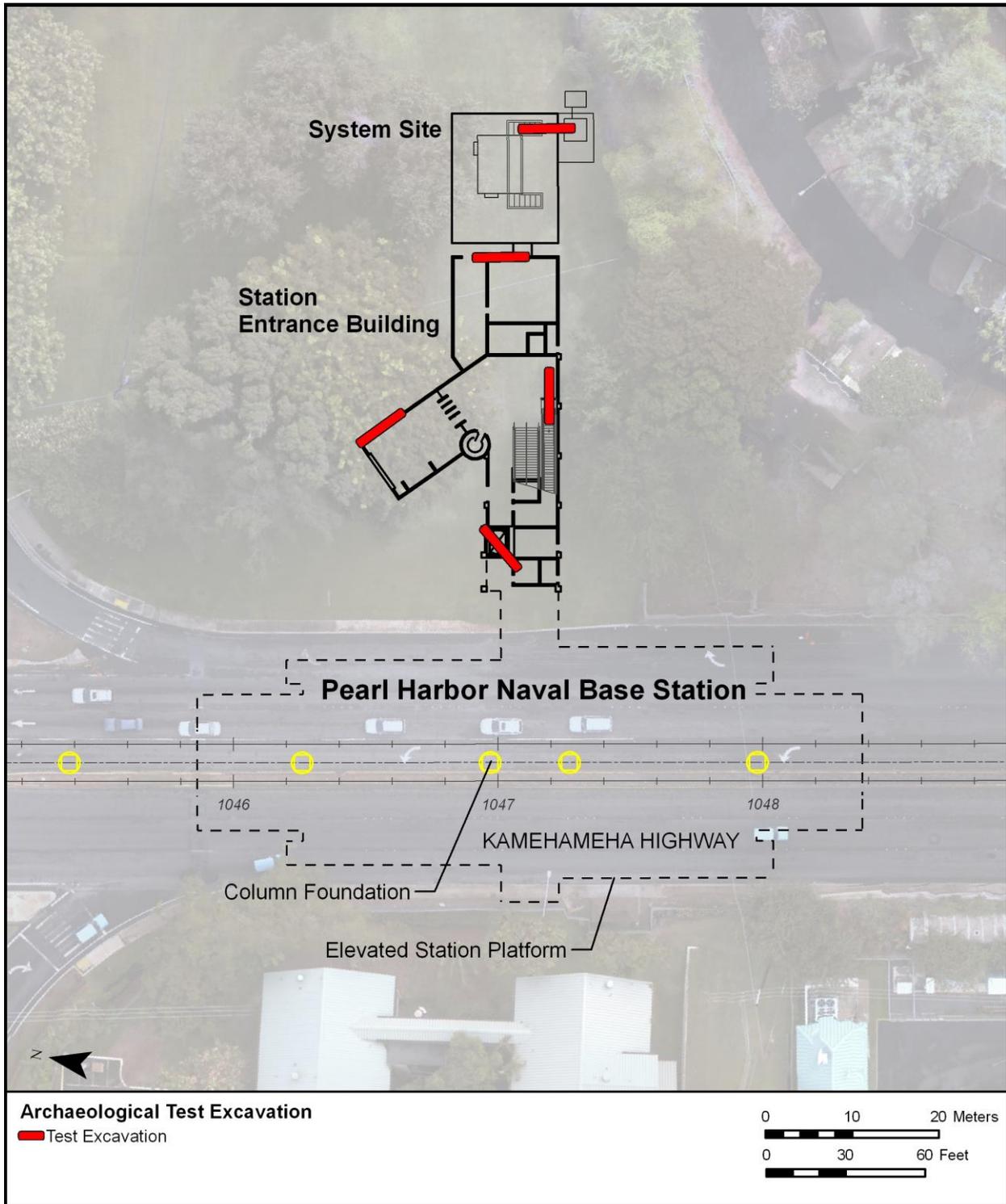


Figure 59. Map Sheet J 9, Pearl Harbor Naval Base Station, east of Radford Drive (five 20x2 test trenches proposed)

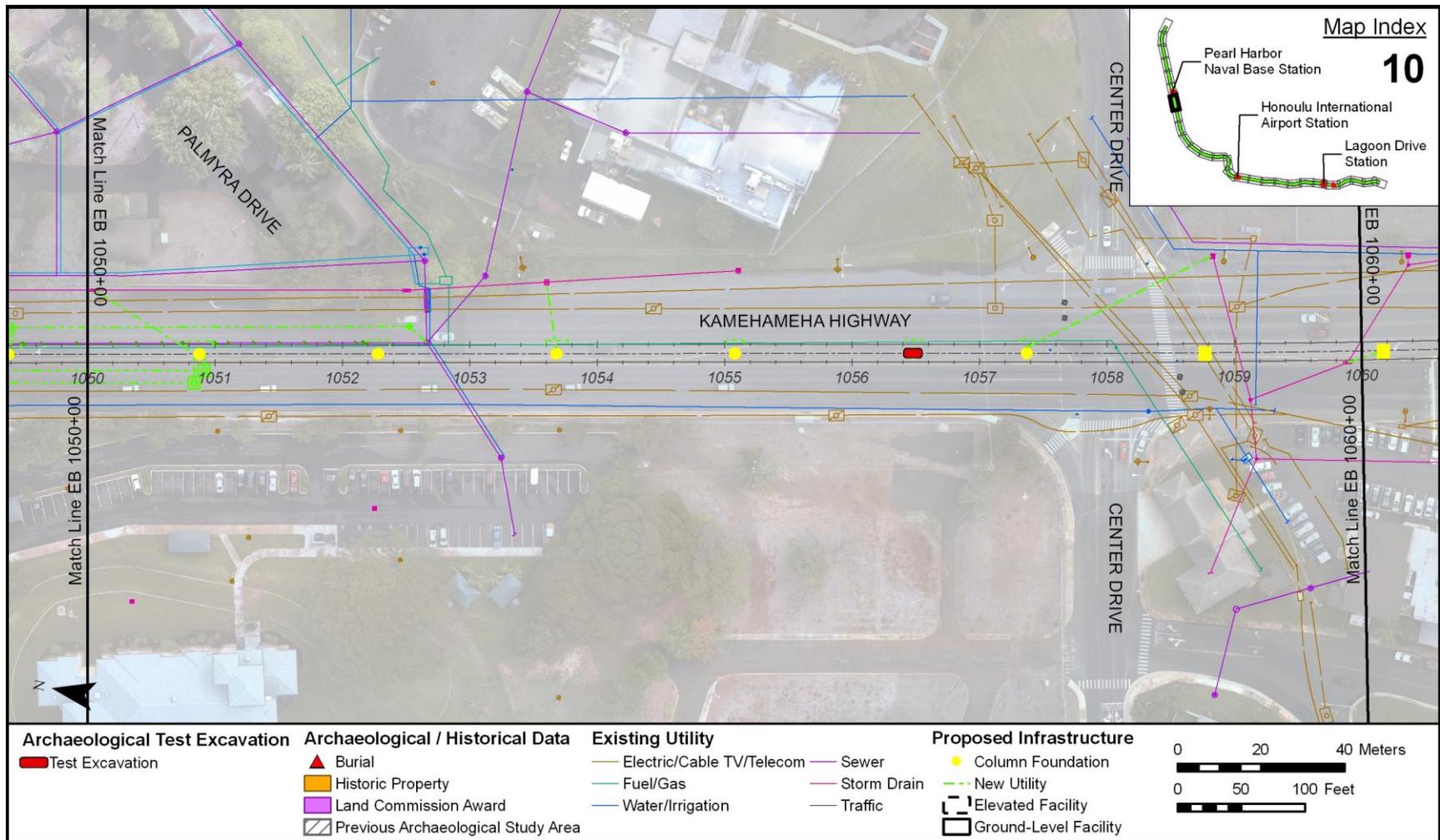


Figure 60. Map Sheet J 10 (near Center Drive), one 10x3 excavation at column foundation @ 1056+50

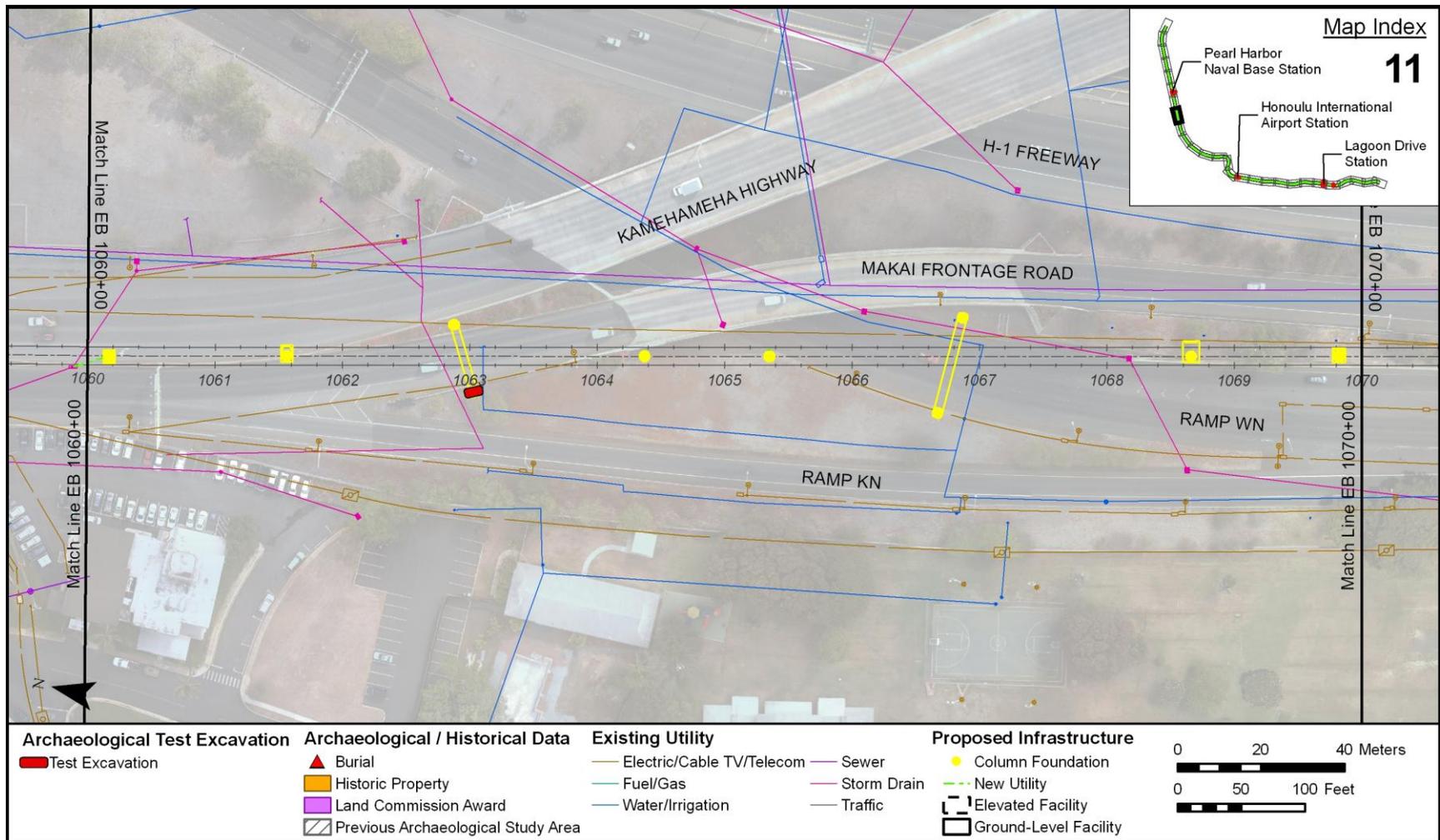


Figure 61. Map Sheet J 11 (near Makai Frontage Road), one 10x3 excavation at *makai* column foundation @ 1063+00

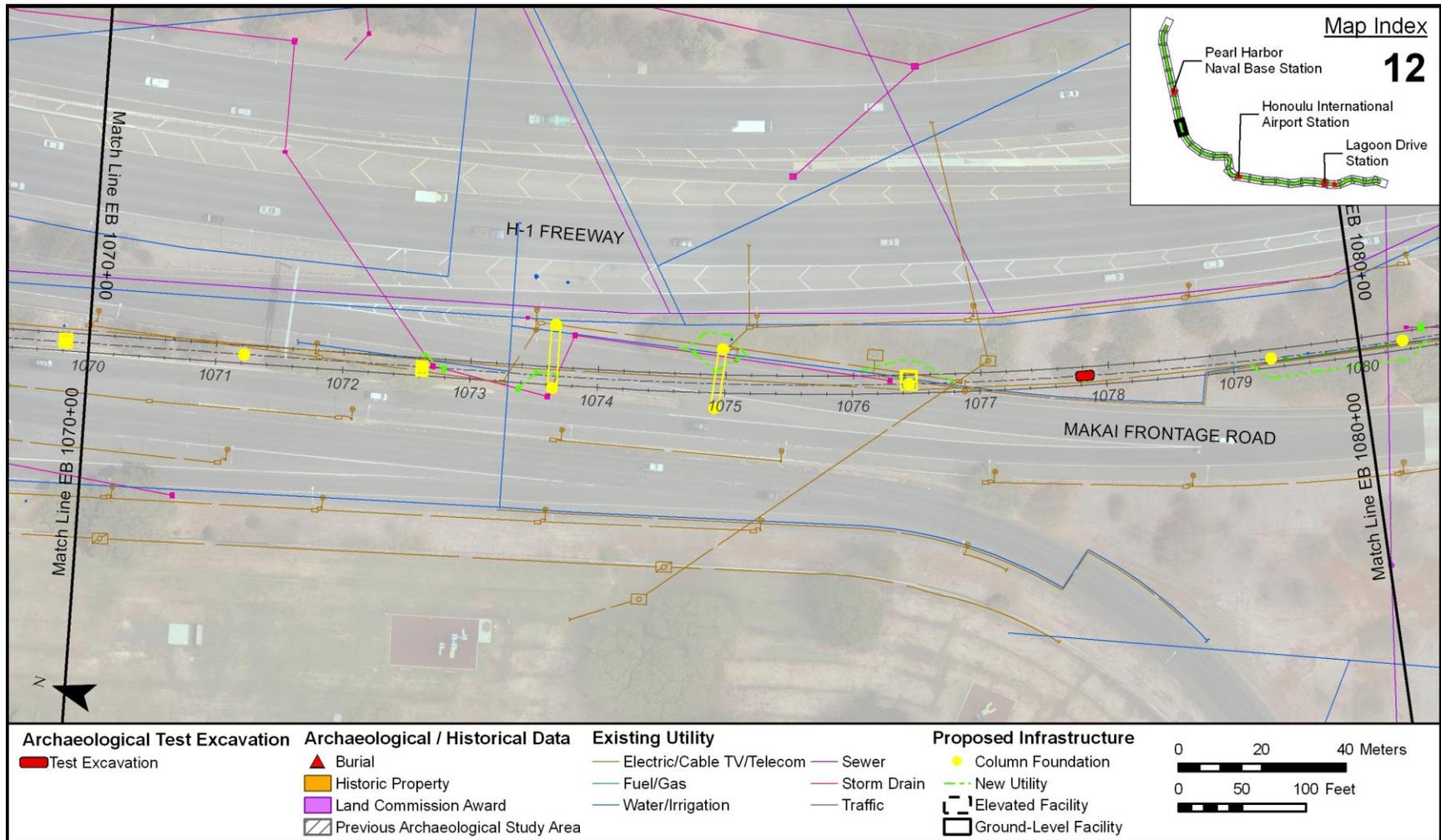


Figure 62.. Map Sheet J 12, one 10x3 excavation at column foundation @ 1077+80

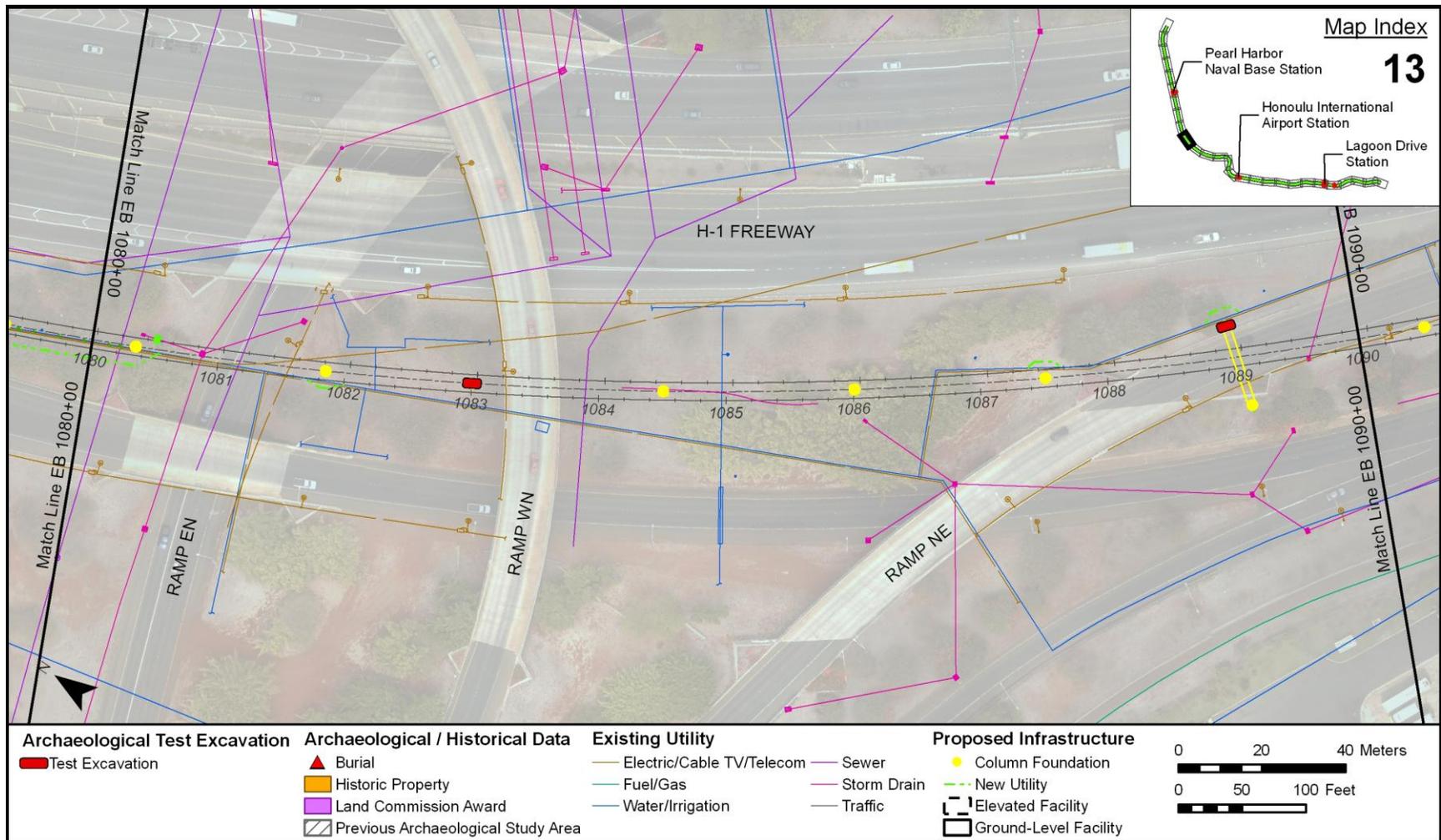


Figure 63. Map Sheet J 13, two 10x3 column foundation excavations @ 1083+00 & (*mauka*) 1089+00

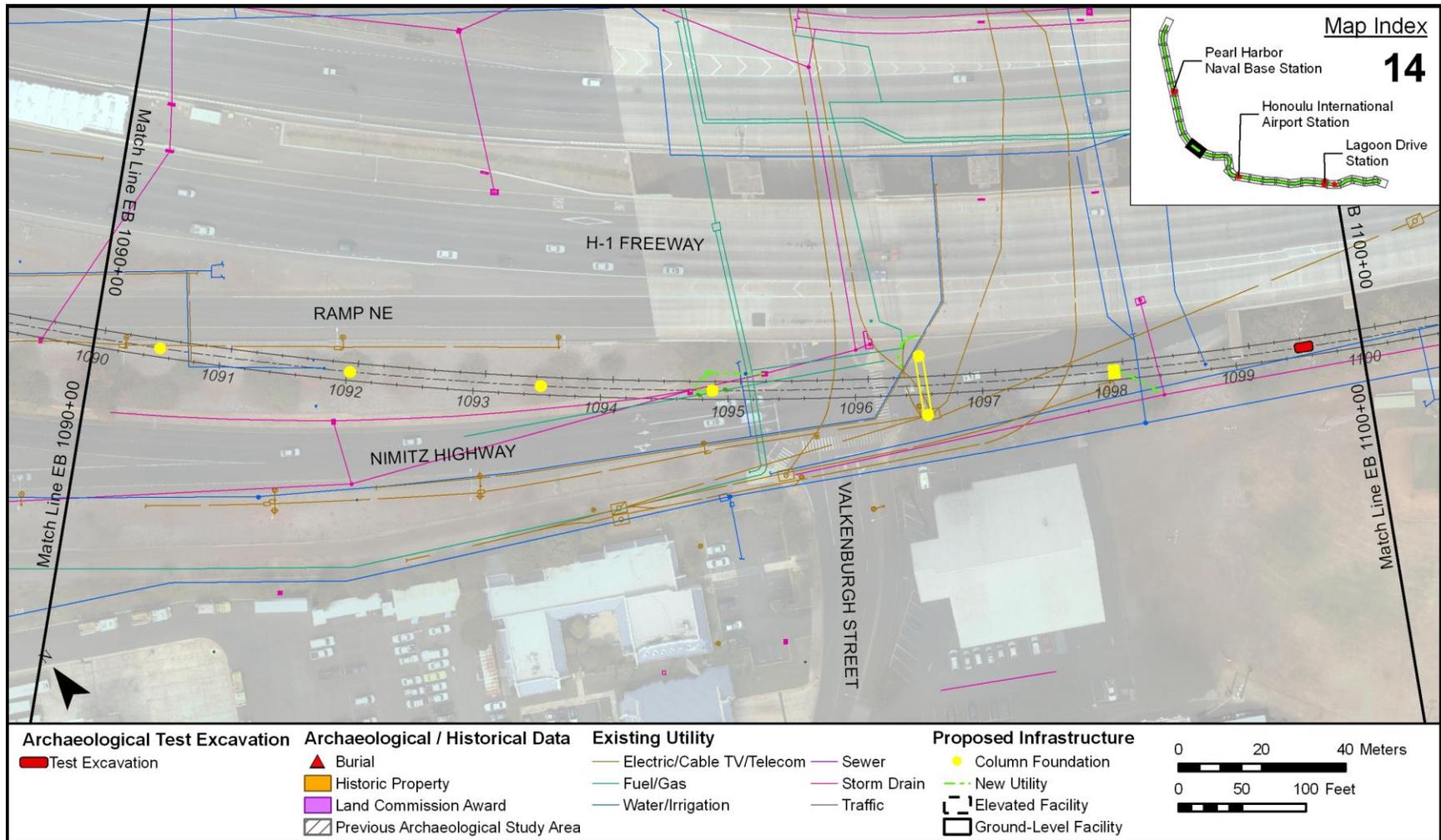


Figure 64. Map Sheet J 14, one 10x3 excavation at column foundation @ 1099+50

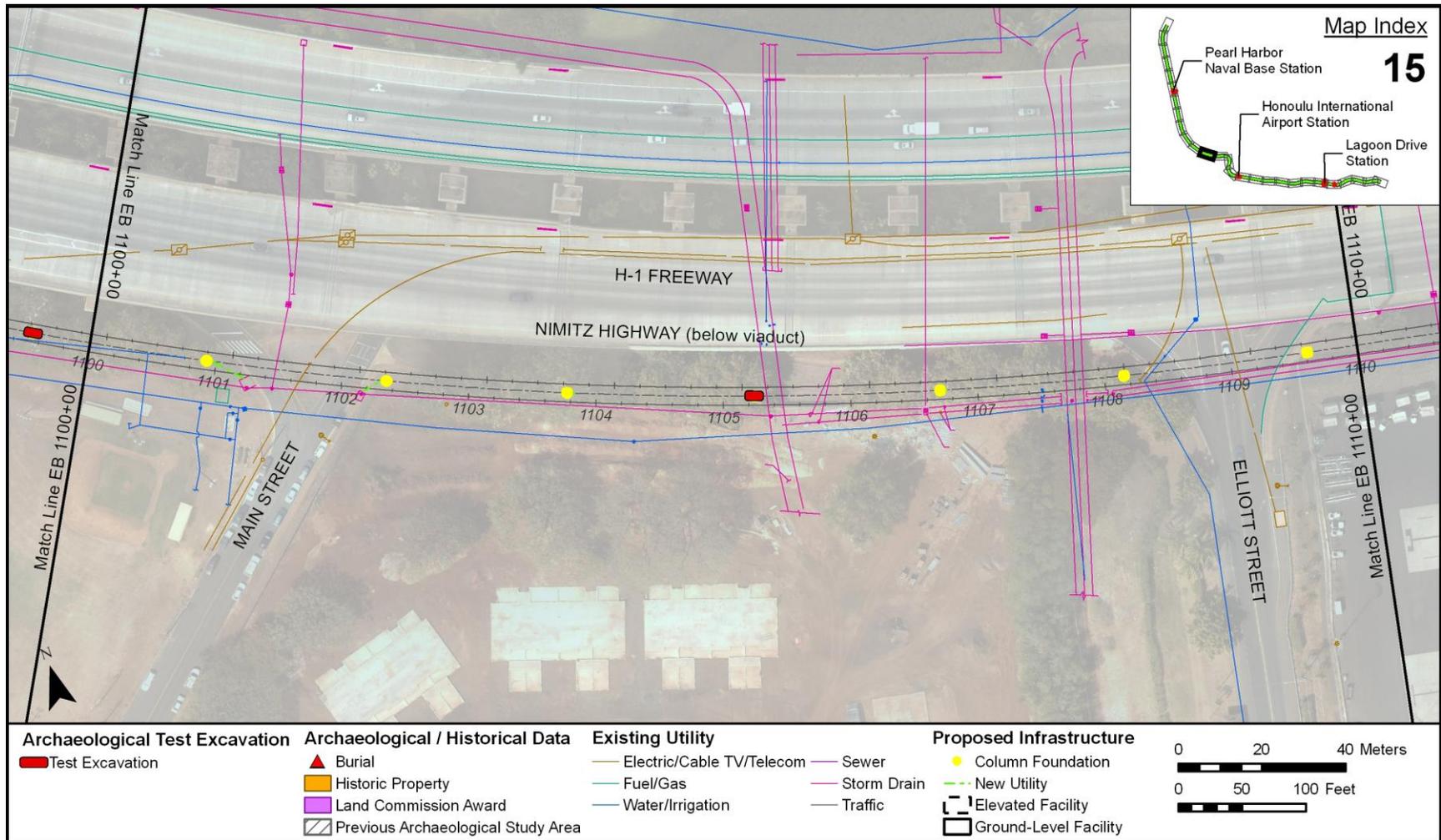


Figure 65. Map Sheet J-15, one 10x3 excavation at column foundation @ 1105+20

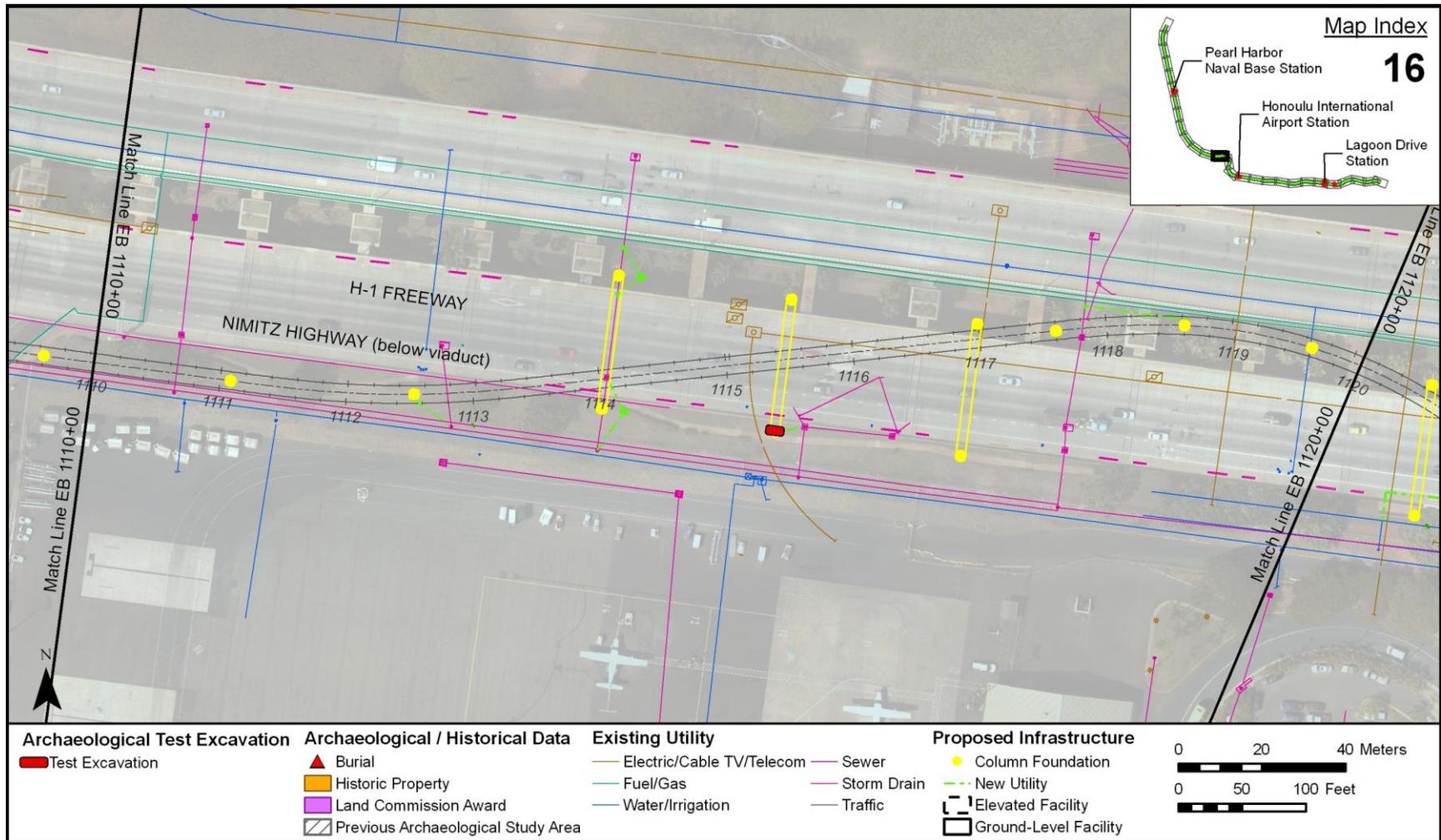


Figure 66. Map Sheet J 16, one 10x3 excavation at (*makai*) column foundation @ 1115+30

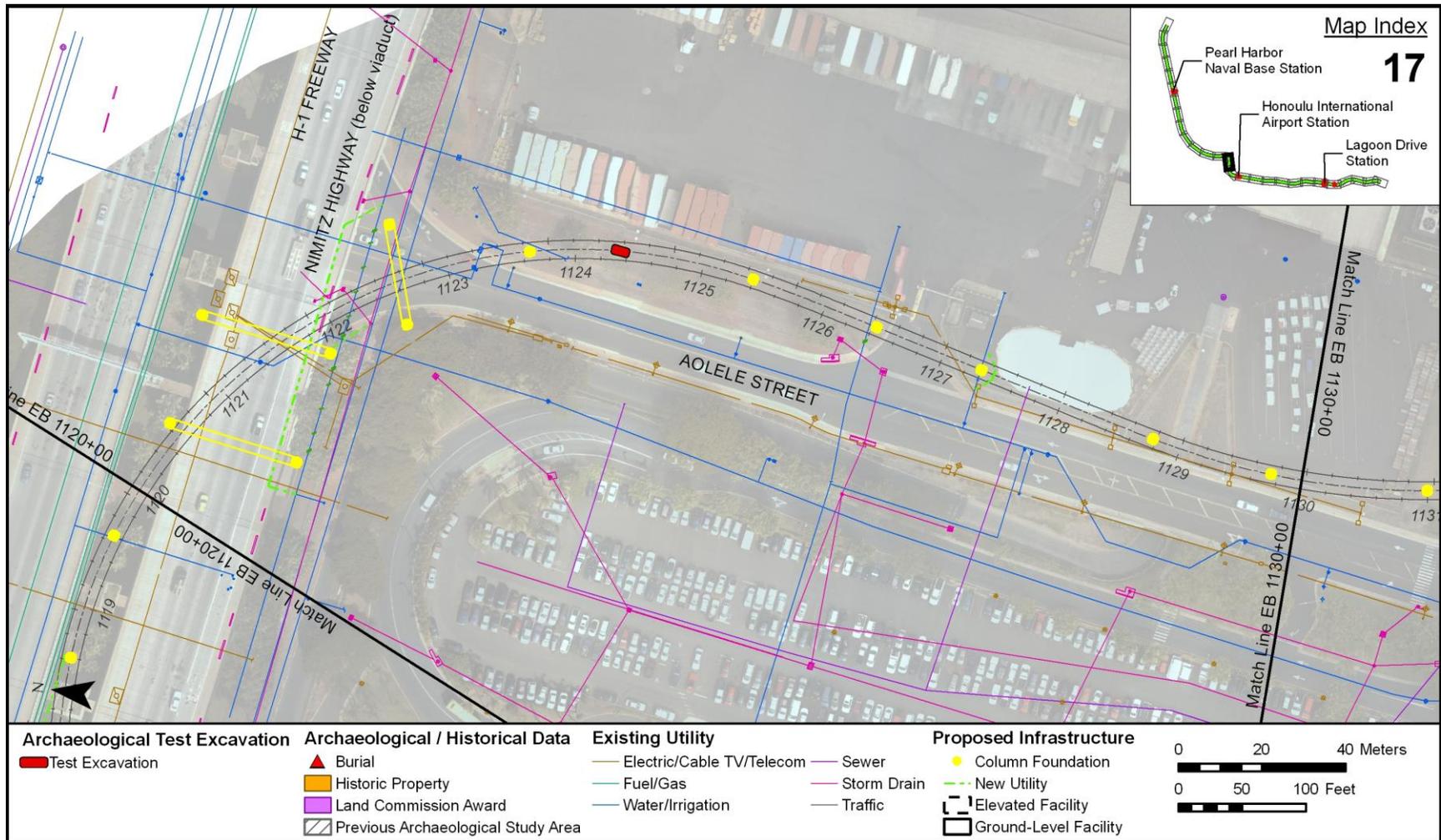


Figure 67. Map Sheet J 17, one 10x3 excavation at column foundation @ 1124+ 30

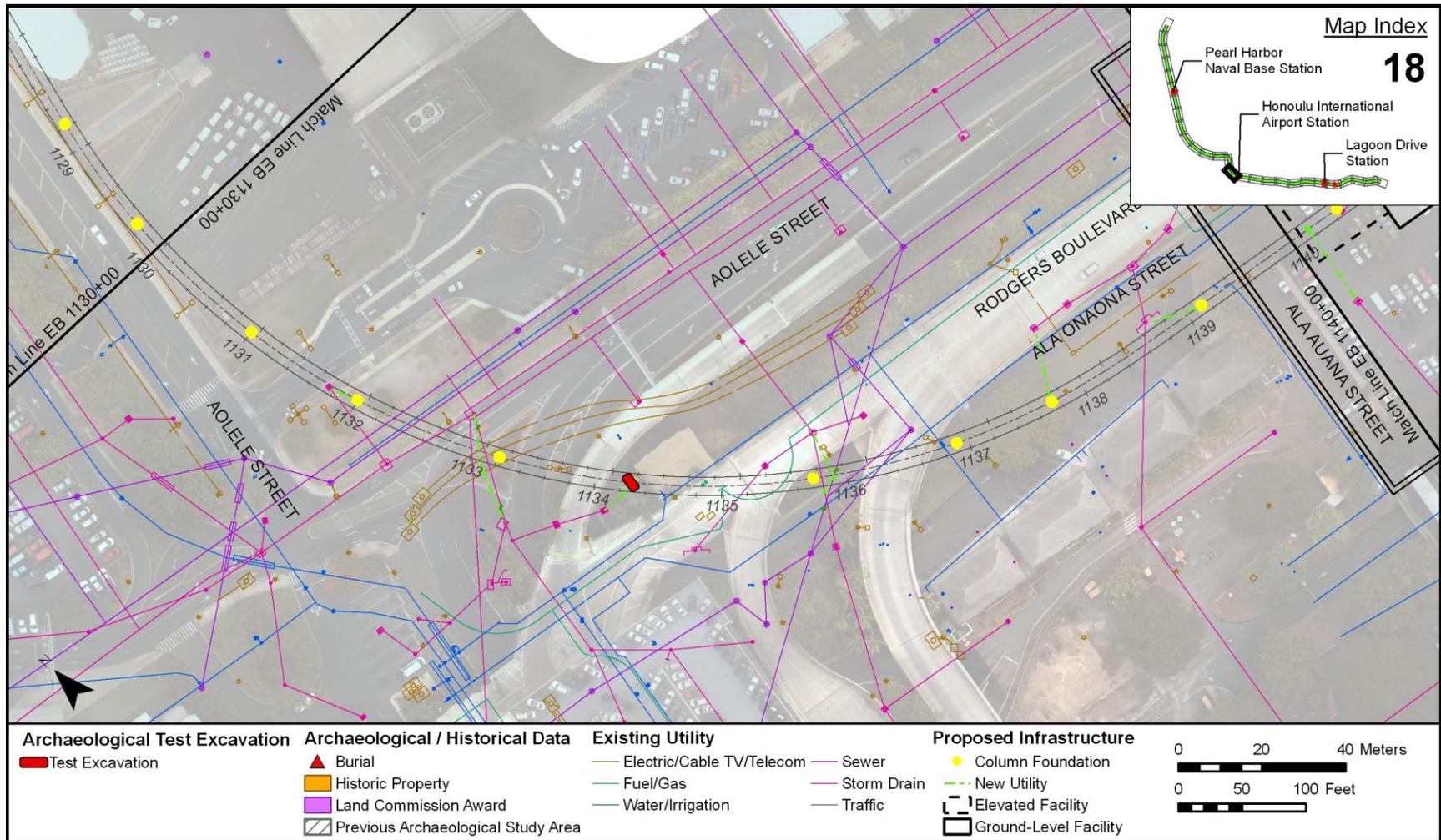


Figure 68. Map Sheet J 18, one 10x3 excavation at column foundation @ 1134+ 30

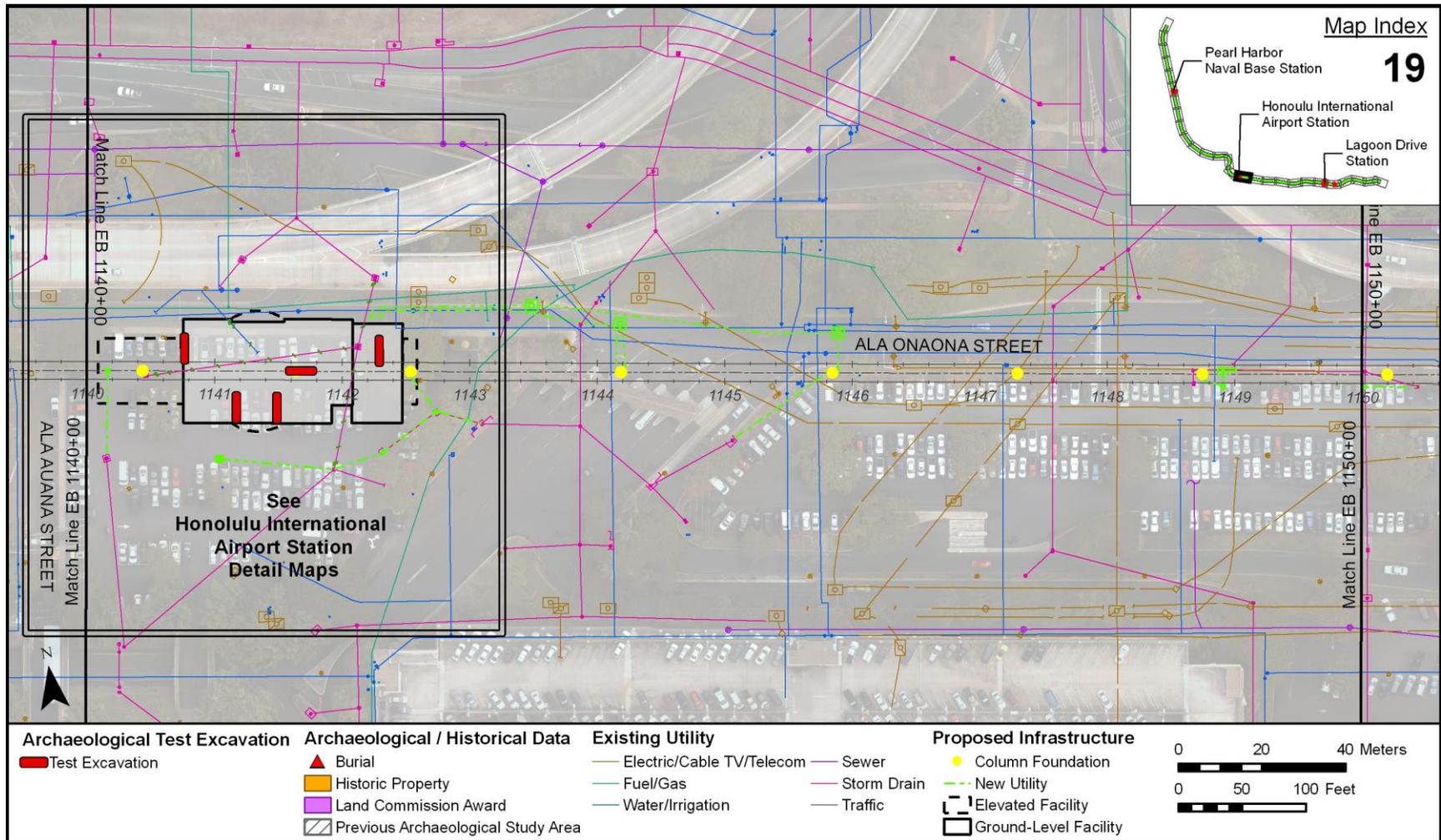


Figure 69. Map Sheet J 19, none (see Station discussion below)

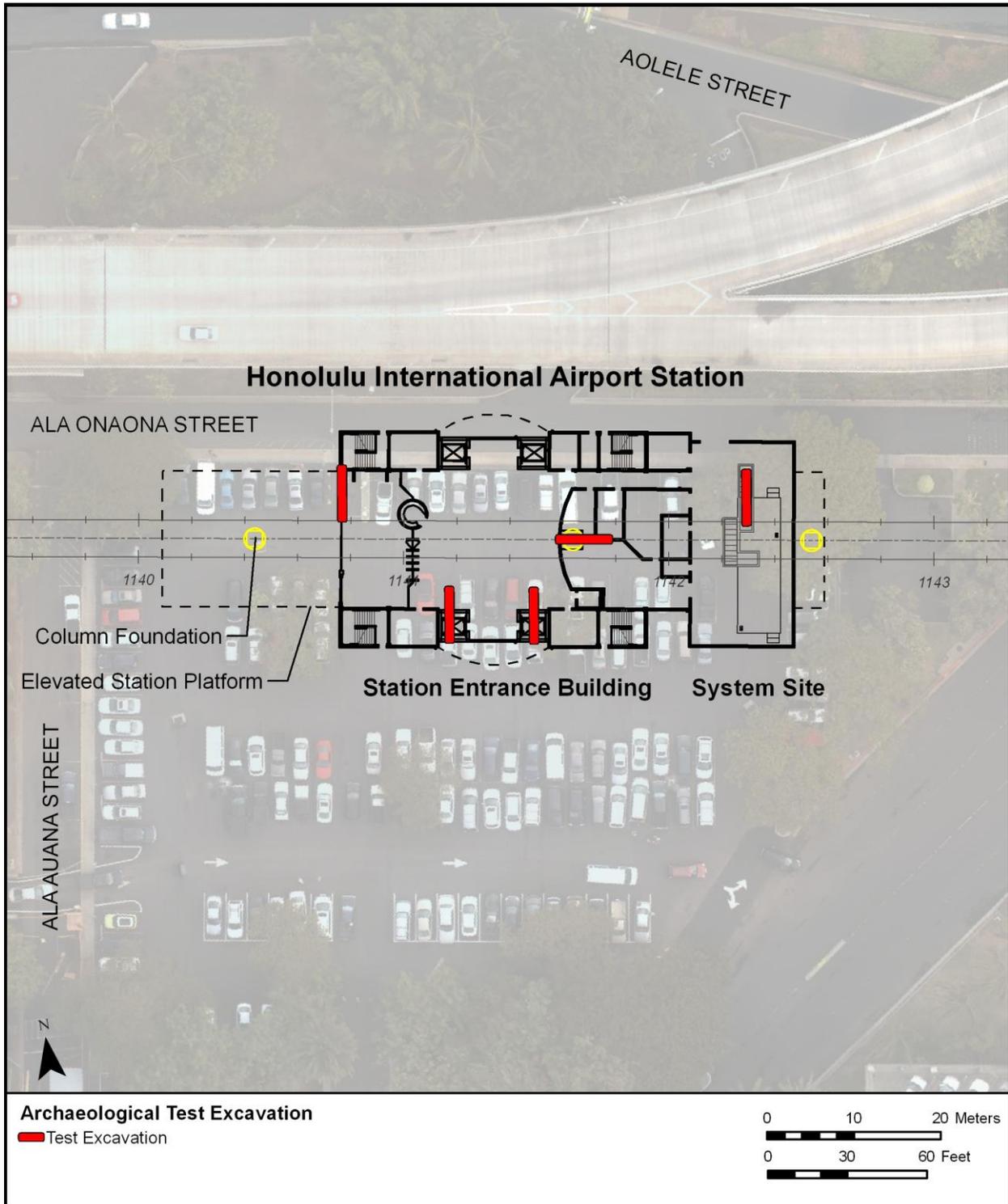


Figure 70. Map Sheet J-19, Honolulu International Airport Station (5 test trenches)

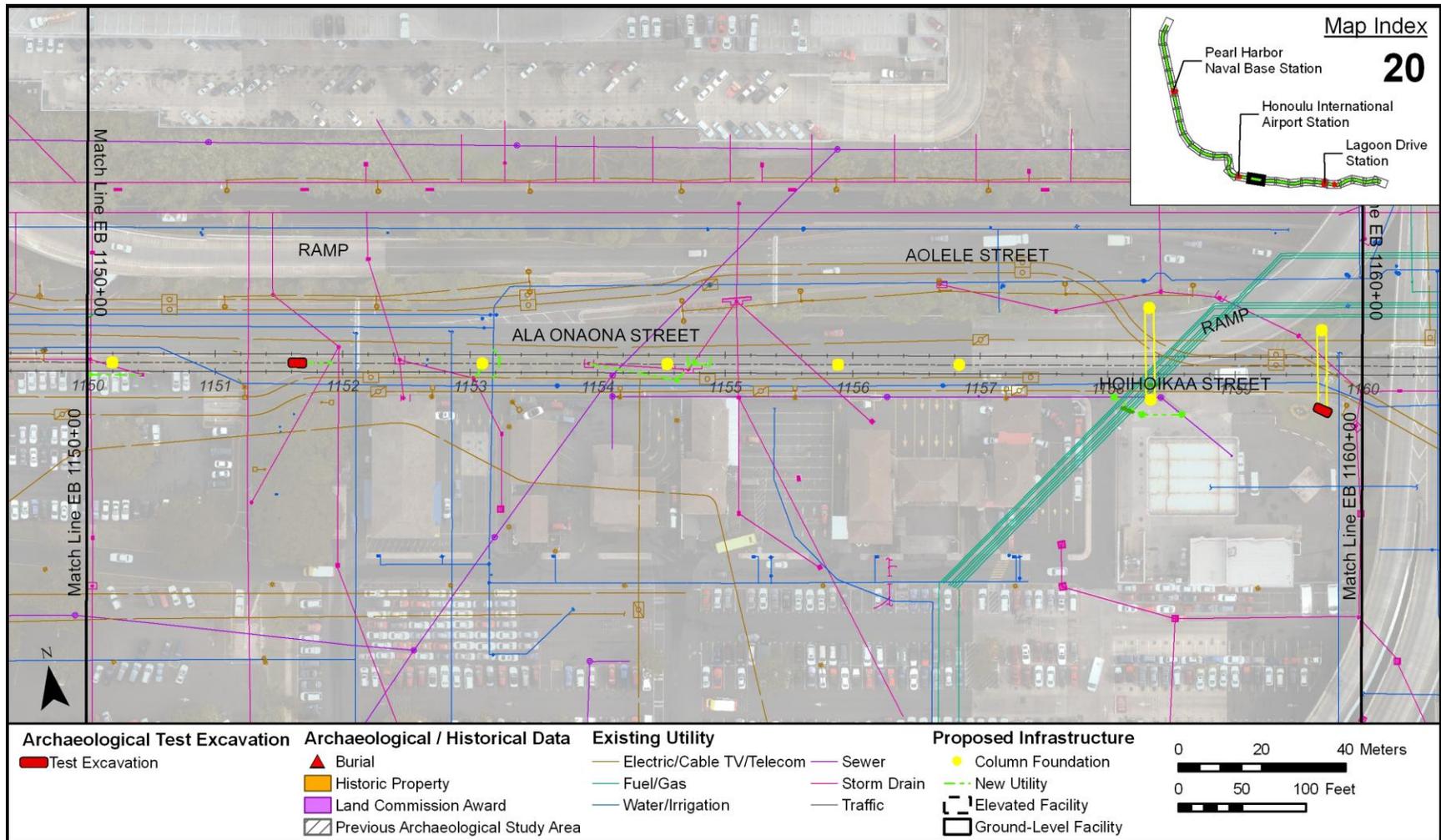


Figure 71. Map Sheet J 20, two 10x3 column foundation excavations @ 1151+60 & 1159+ 70 (*makai*)

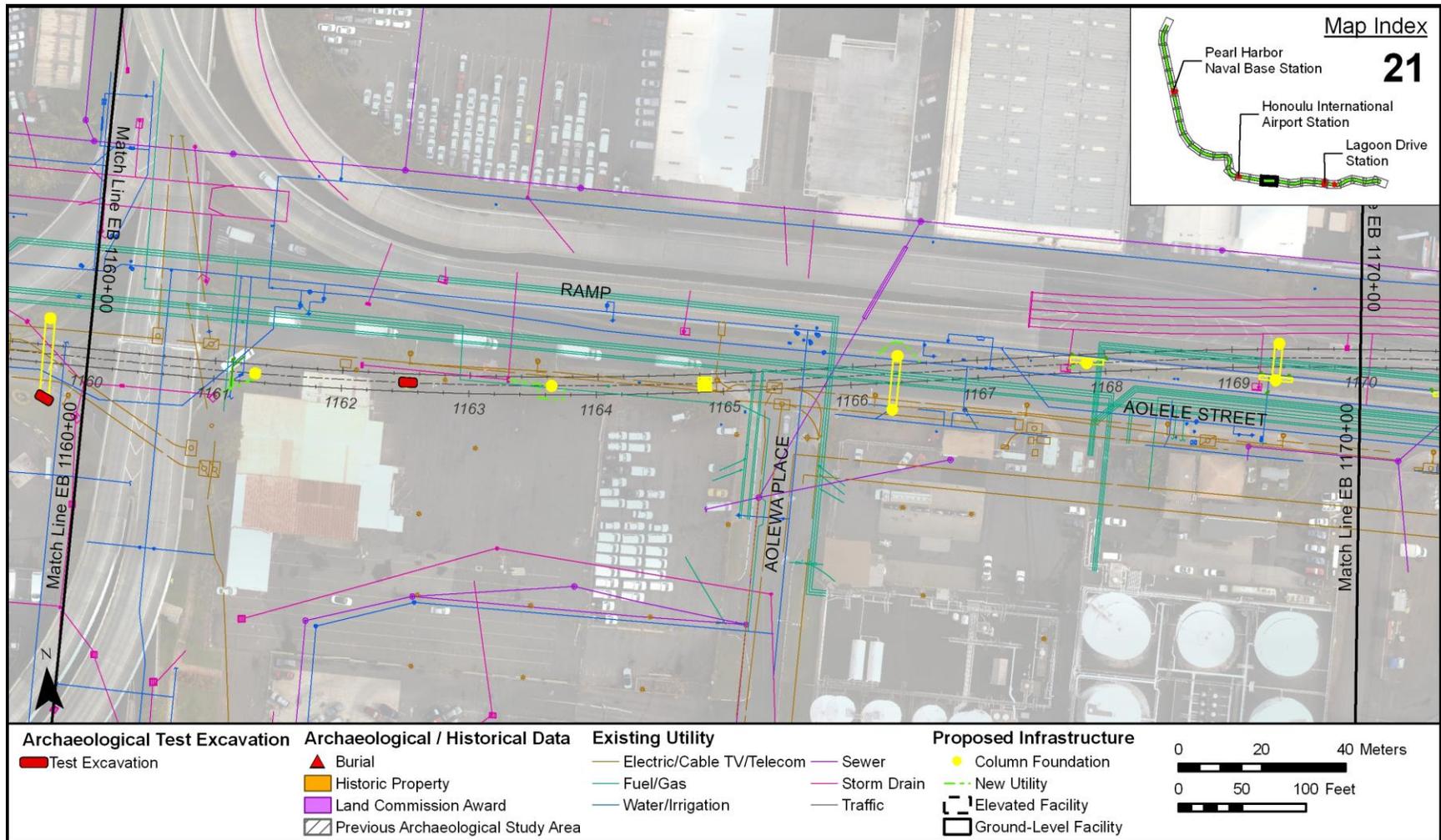


Figure 72. Map Sheet J 21, one 10x3 excavation at (*makai*) column foundation @ 1162+50

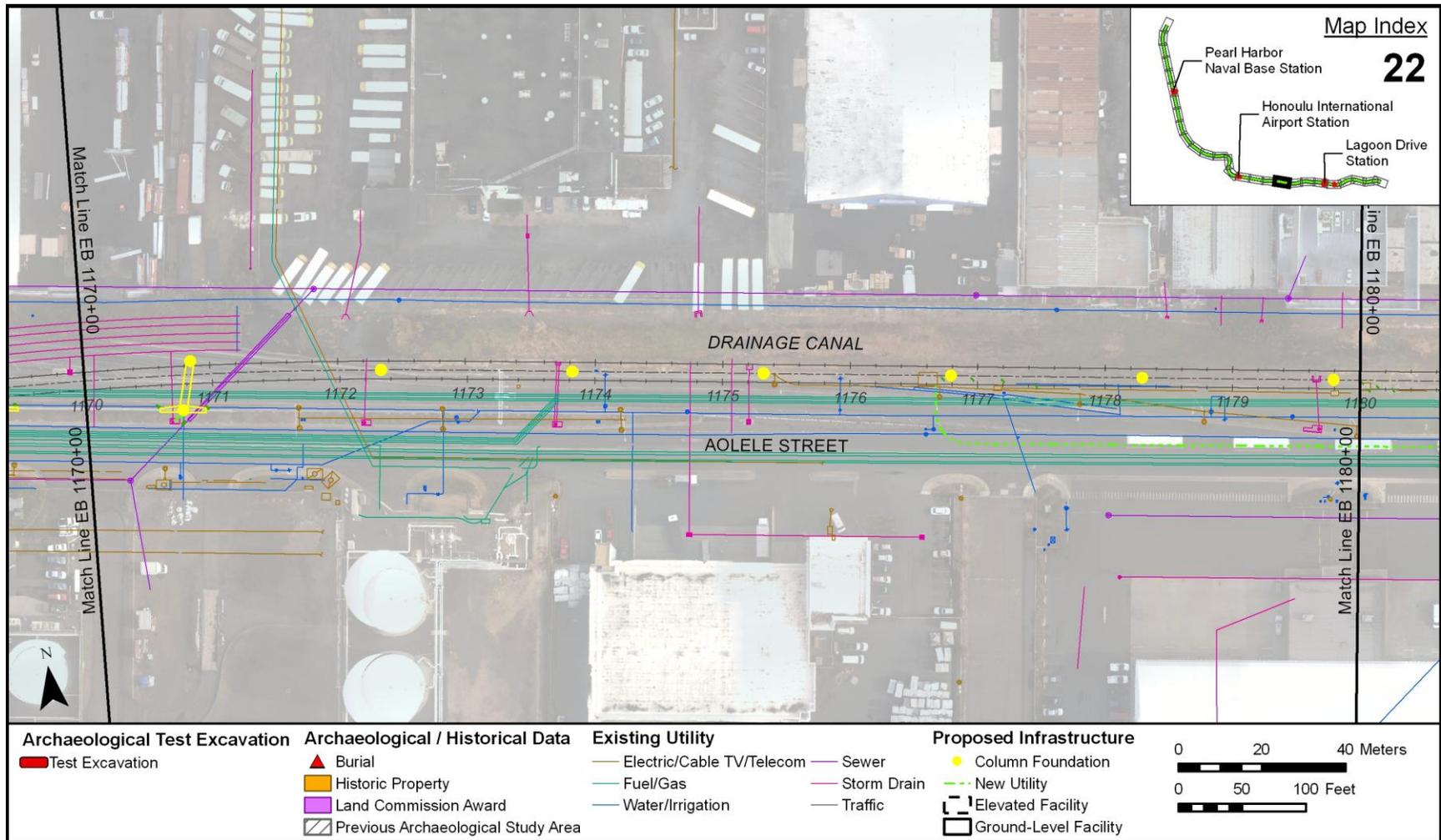


Figure 73. Map Sheet J 22, none

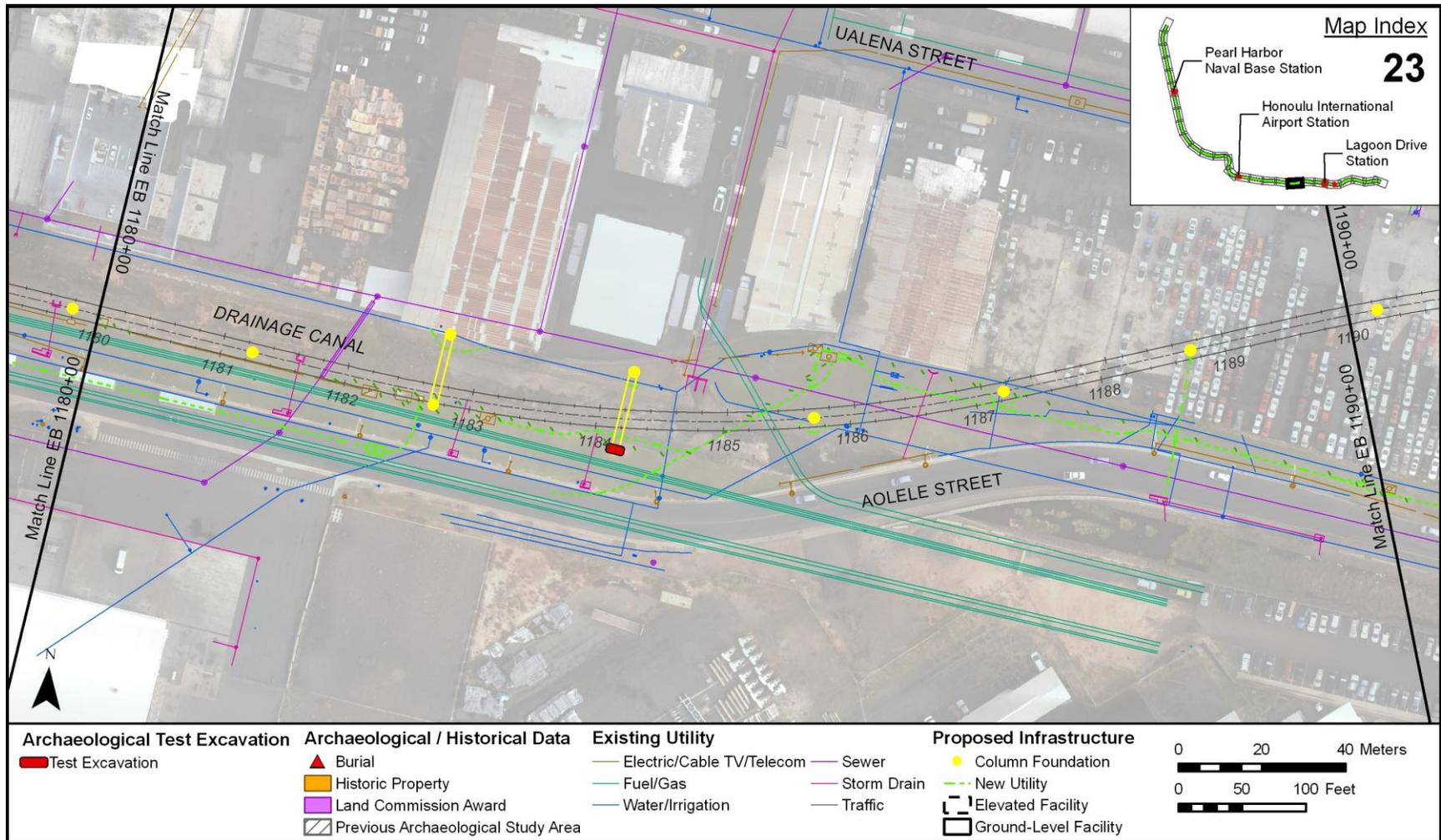


Figure 74. Map Sheet J 23, one 10x3 excavation at (*makai*) column foundation @ 1184+20

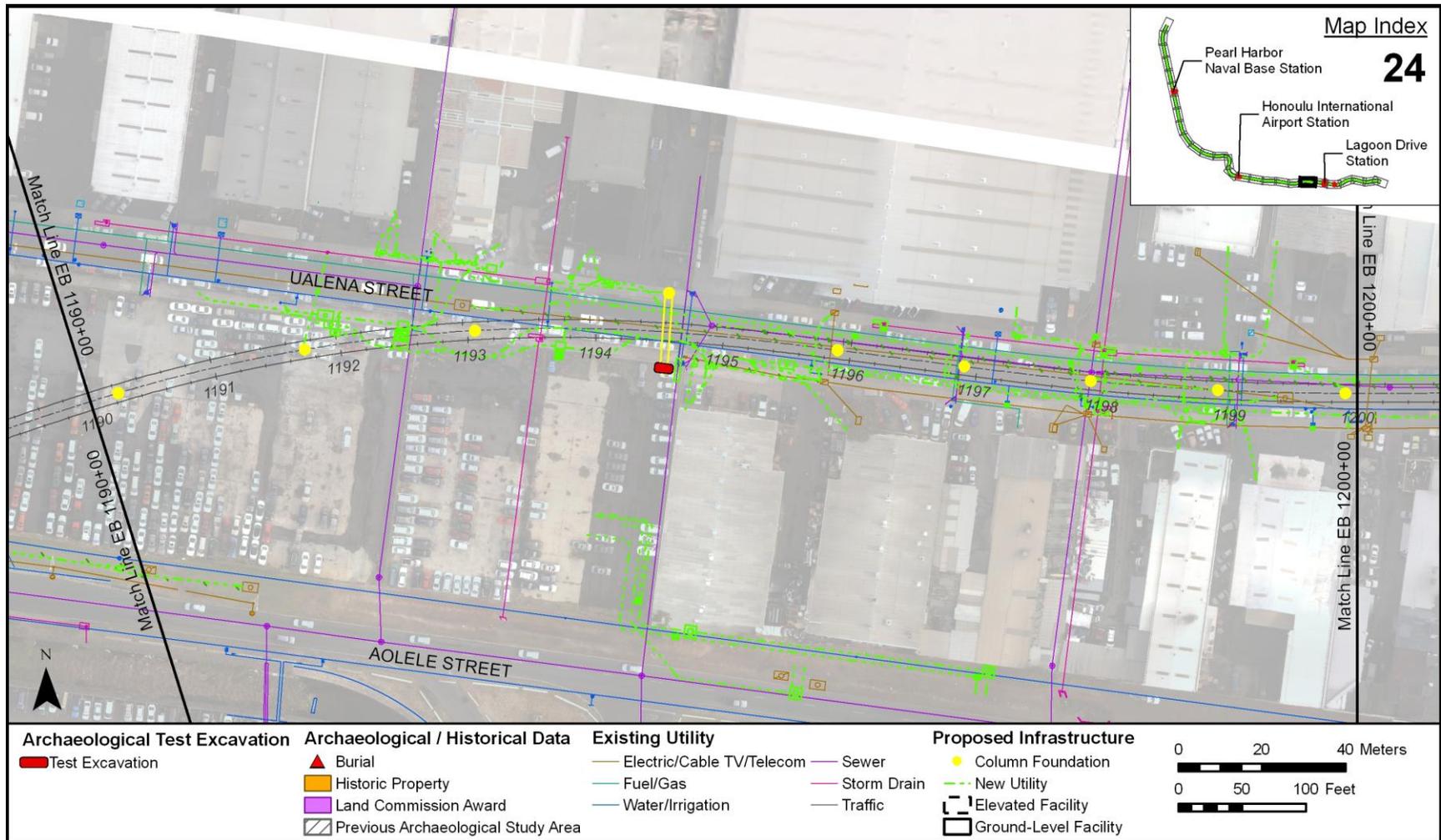


Figure 75. Map Sheet J 24, one 10x3 excavation at (makai) column foundation @ 1194+50

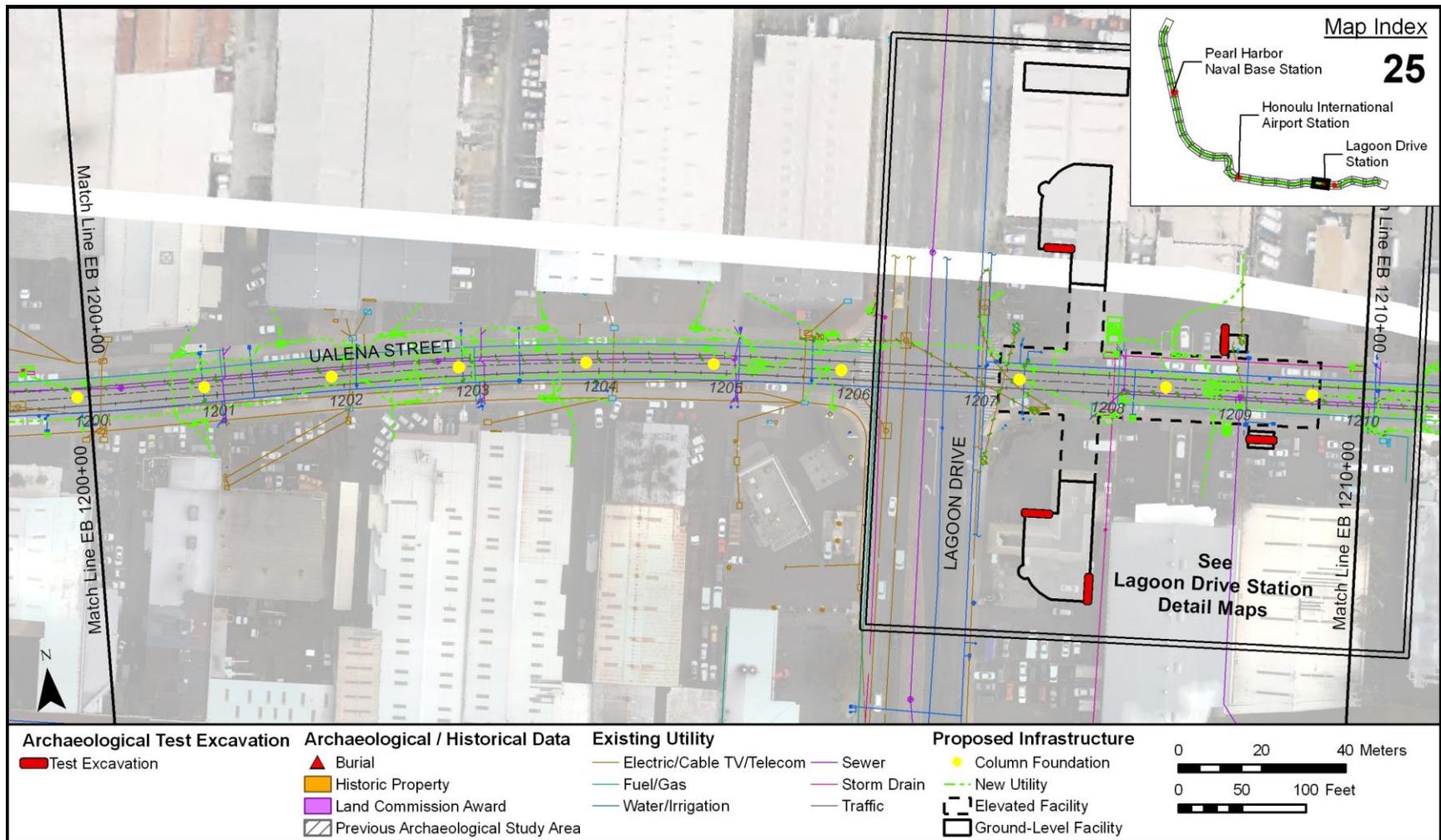


Figure 76. Map Sheet J 25, none (see Station discussion below)

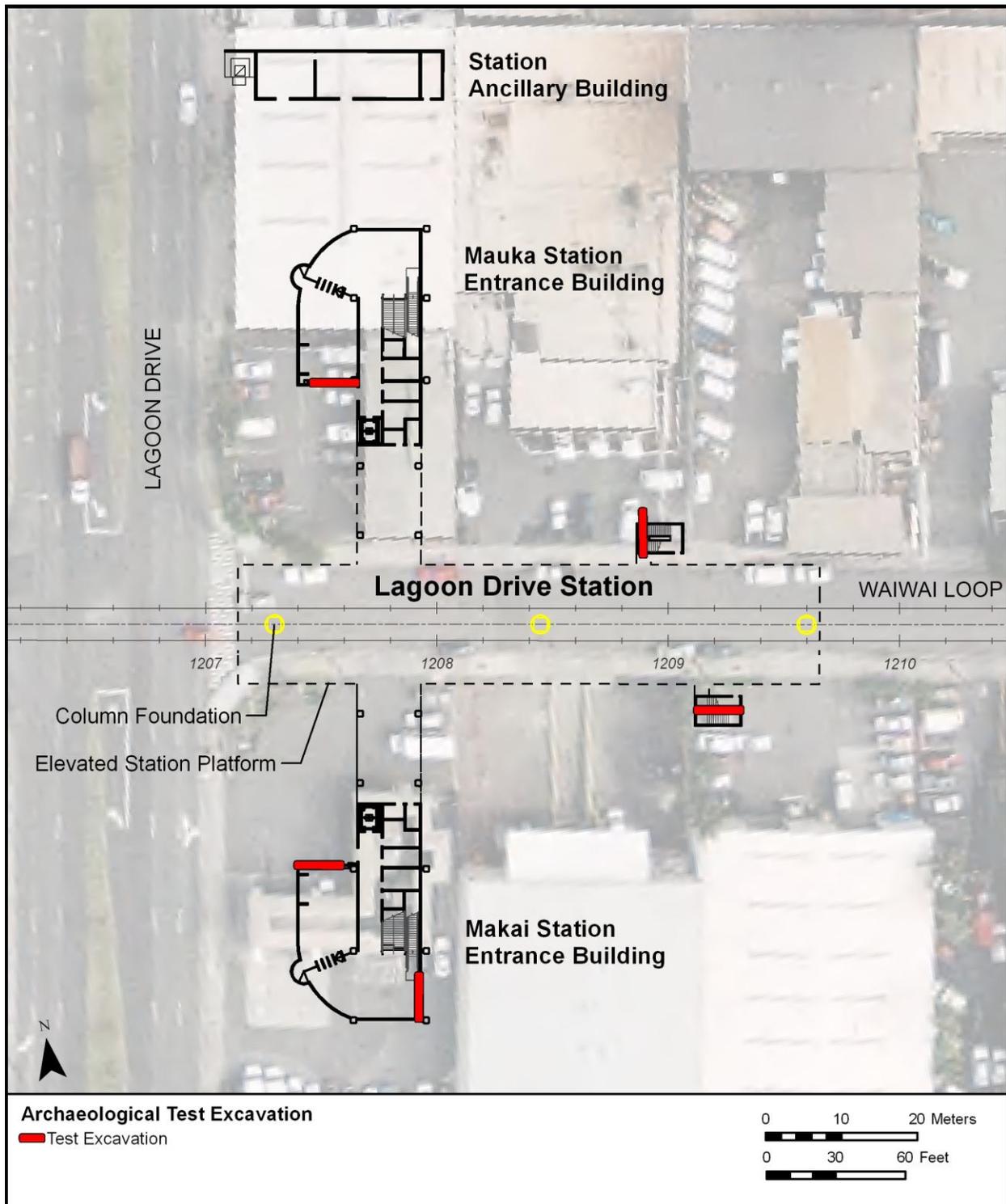


Figure 77. Lagoon Drive Station, 5 20x2 test trenches (2 at Mauka Station Entrance Building, one at mauka access and 2 at Makai Station Entrance Building)

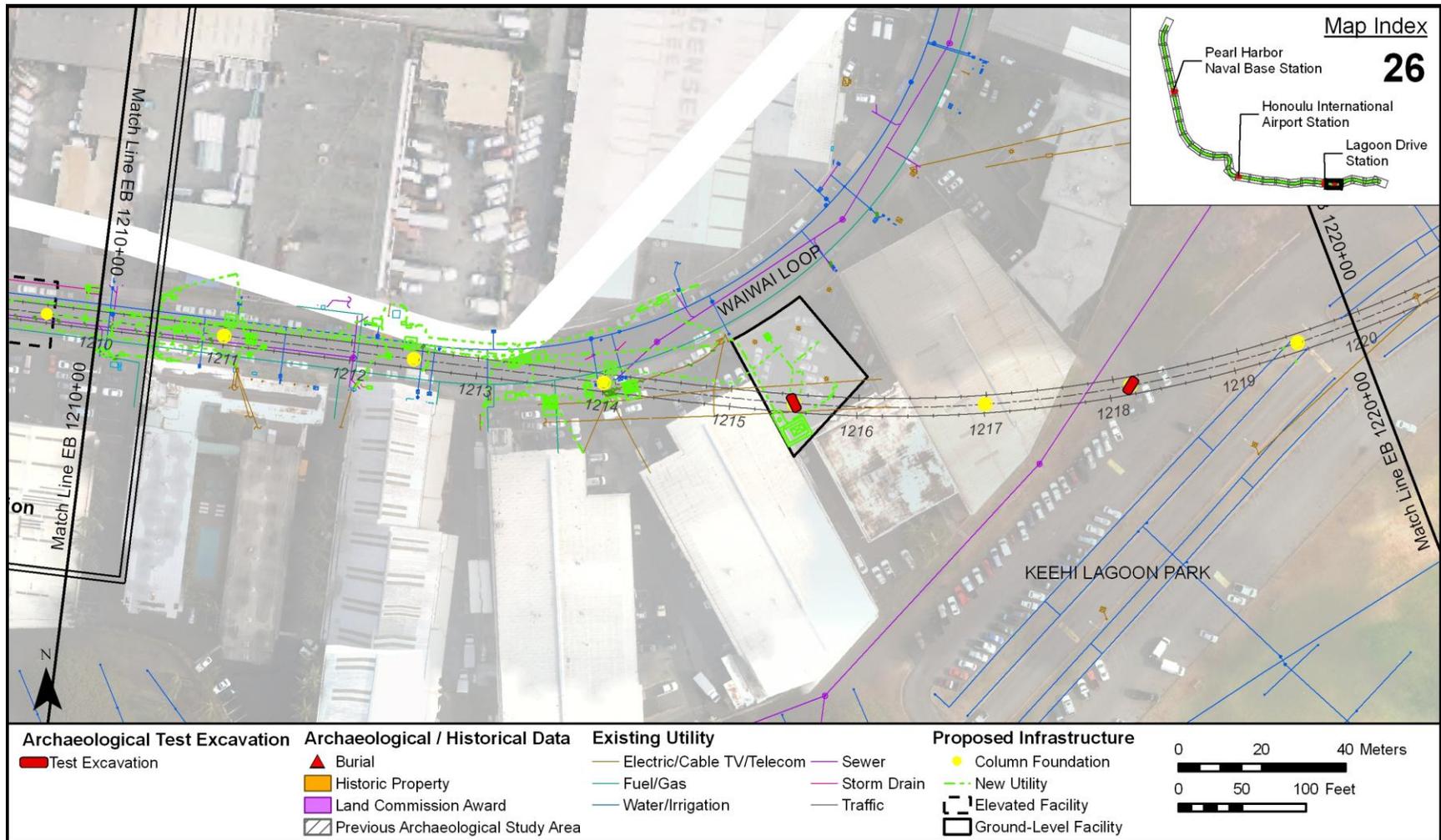


Figure 78. Map Sheet J 26, two 10x3 excavations at column foundations @ 1215+50 & 1218+20

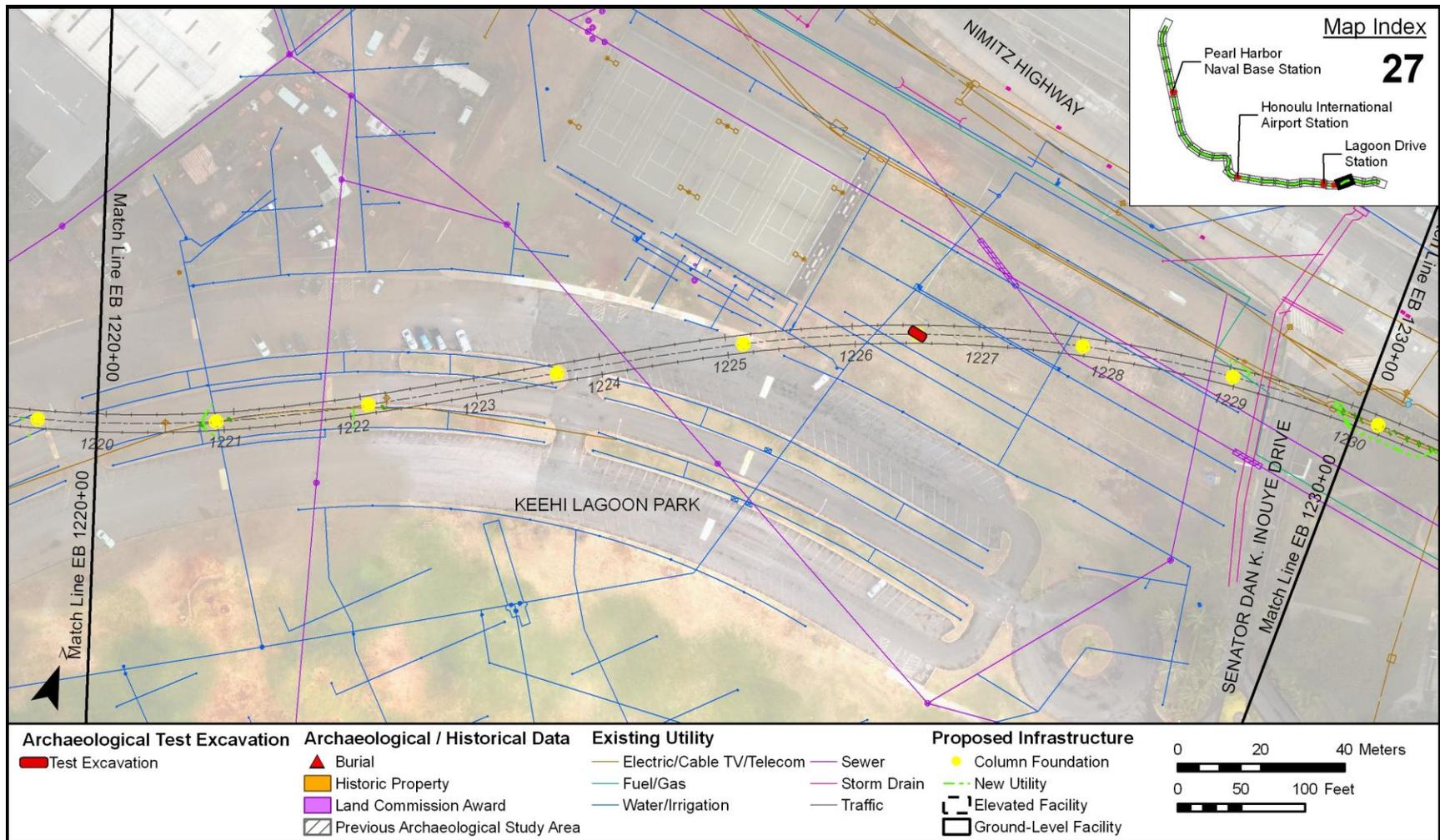


Figure 79. Map Sheet J 27, one 10x3 excavation at column foundation @ 1226+50

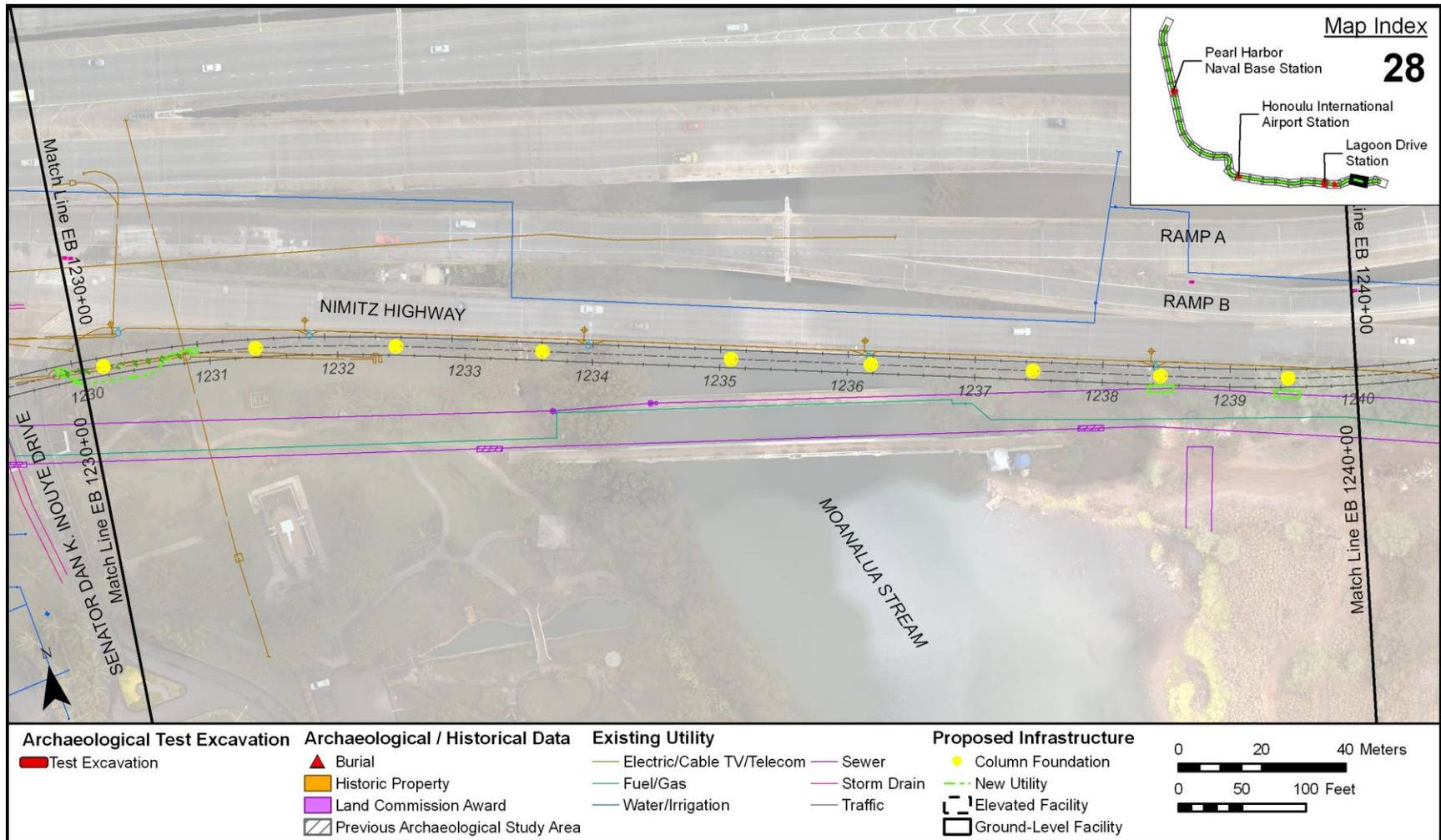


Figure 80. Map Sheet J 28, none

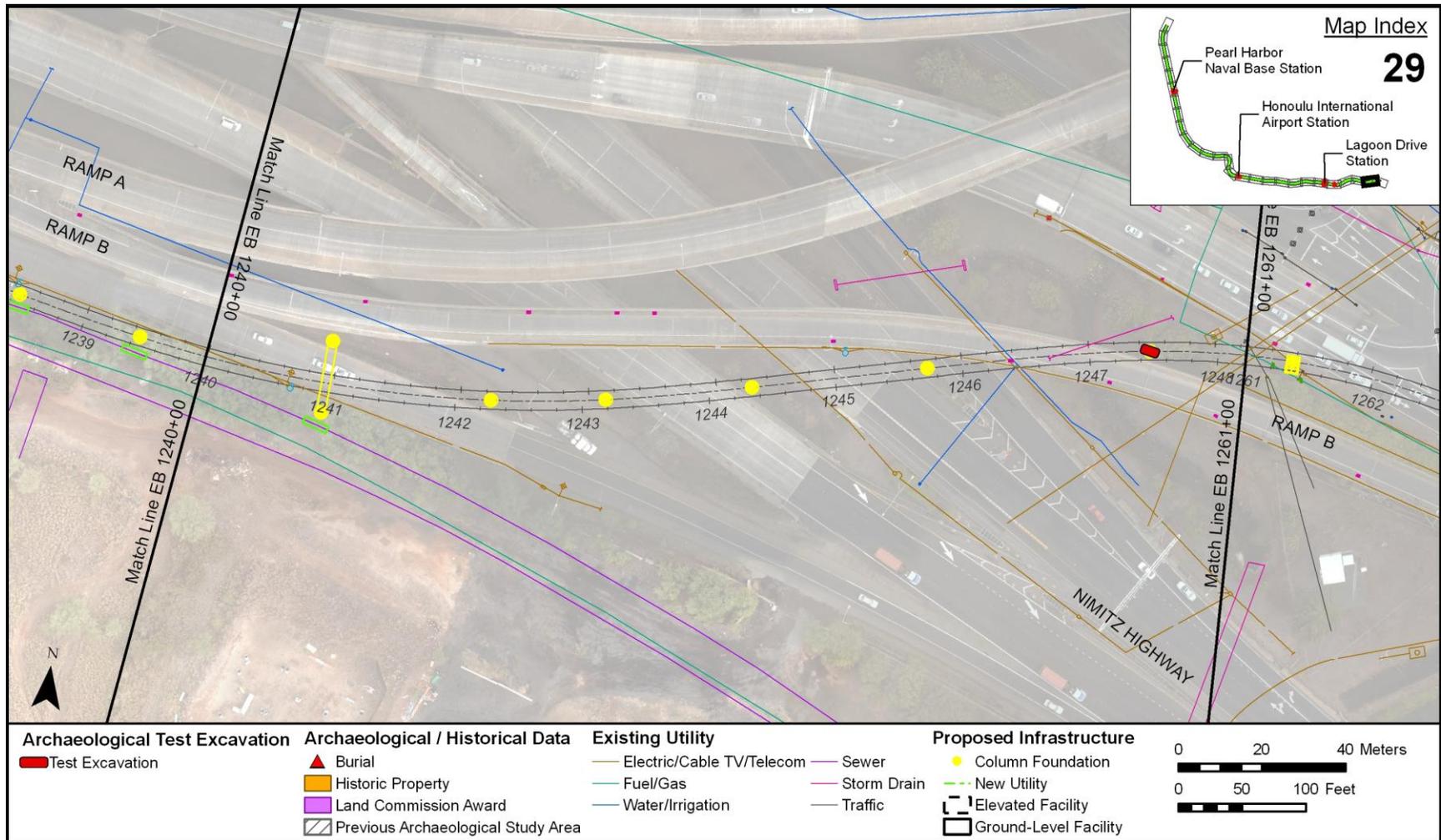


Figure 81. Map Sheet J 29, one 10x3 excavation at column foundation @ 1247+50

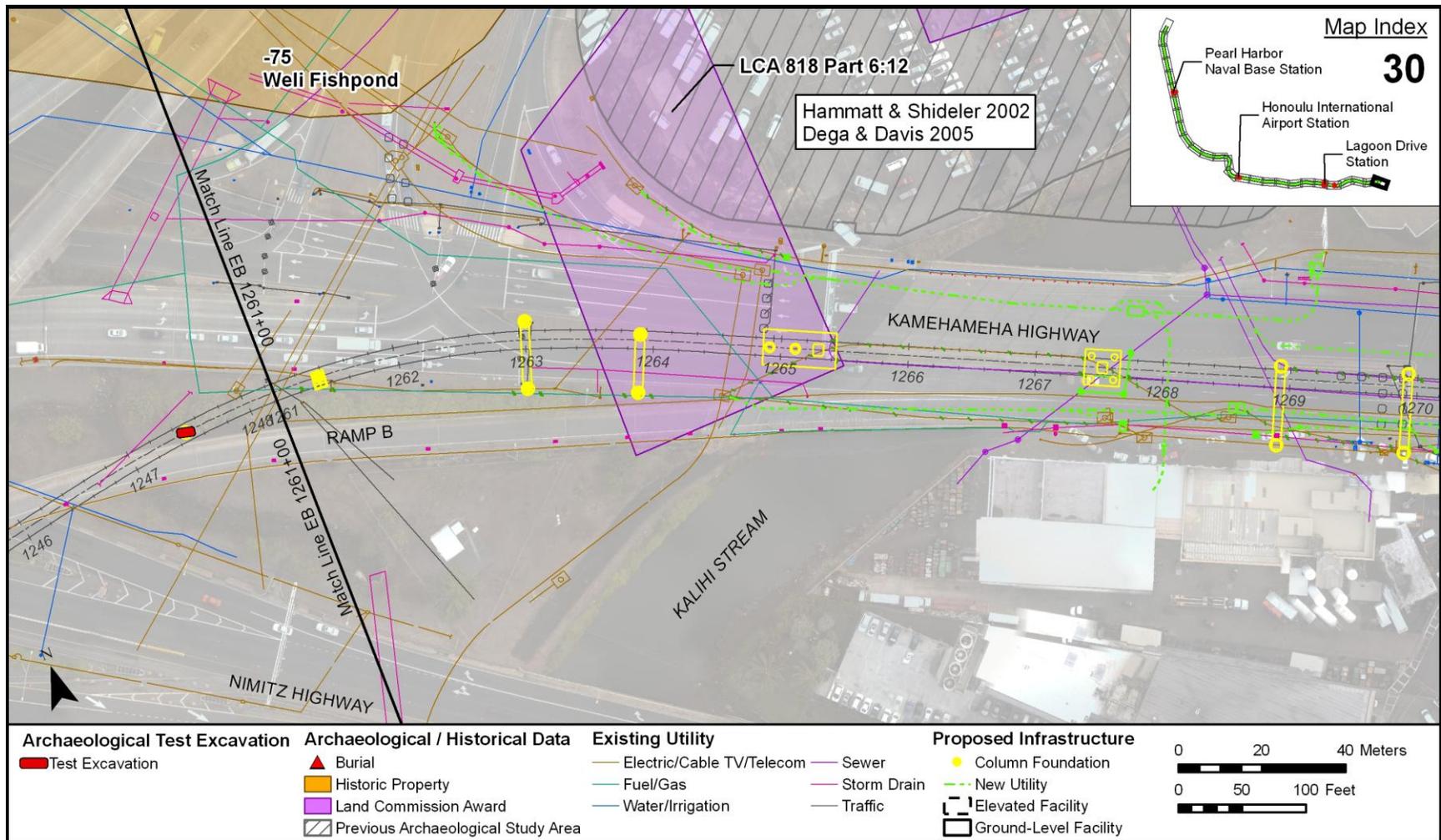


Figure 82. Map Sheet J 30 connecting to the AISP for Phase 4 by Kalihi Stream

9.2 Decisions for Additional AIS Testing

The overall objective of the archaeological cultural resource identification activities described in this AISP is to locate and document archaeological cultural resources that may be affected by Project construction. Once identified, these archaeological deposits will be investigated and recorded in sufficient detail so that their significance can be assessed and the Project's potential effect on significant archaeological deposits can be evaluated.

The AIS investigation will also strive to provide information to project engineers that will allow for the avoidance of significant archaeological deposits, particularly burials, during the Airport Phase 3 construction. The current sampling strategy is based on preliminary engineering, and the results of the Airport AIS will help inform the interim and final engineering. There is some flexibility in the placement of the Project's construction components, for example support columns can be shifted up to 30 feet parallel to the HHCTCP corridor alignment. Using this limited engineering flexibility for certain construction components, and the information from the AIS, the project engineers will attempt to find a design and engineering solution whereby project construction will avoid significant archaeological deposits. Only if no solution is possible will mitigation measures, such as archaeological data recovery and burial relocation, be considered.

The sampling strategy outlined above shows the locations of the planned 40 test trenches within the 9.06-acre Airport construction phase footprint. It is likely that additional testing will be required to fulfill the identification and documentation objectives of the AIS, and to provide project engineers with the information they need to consider design and engineering solutions that will avoid significant archaeological cultural resources. Additional testing will likely be required at the location of archaeological finds; it may also be required in areas of no finds, but where excavation results for that area, for example the sediment types exposed, indicated more testing is warranted.

9.2.1 Additional AIS Testing at the Location of Archaeological Discovery

The actual number and location of additional testing locations in the vicinity of a find will depend on various factors, including the type of archaeological resource found, the surrounding existing built environment, and the location—based on preliminary engineering—of project infrastructure that is planned for the location of the find. The actual number and location of additional testing locations will need to be decided on a case-by-case basis based on these factors and in consultation with the City and SHPD.

With each discovery of archaeological features and/or human skeletal remains, a series of notifications will be made. In particular, project engineers will be notified and consulted. In consultation with project engineers, AIS testing in the vicinity of the find will be carried out to target areas that—based on preliminary engineering—will be affected by the project (For example, the utility relocations in the vicinity or in adjacent column foundation footprints). This additional testing will provide additional information about the geographic extent of the find and will help better describe the cultural resource's characteristics.

Because of the narrowness of the project area, the focus for the AIS additional testing will be first to determine the 'Ewa/Diamond Head (east/west axis of the rail alignment) extent of the subsurface deposit. Once this is established, it may be necessary to further test the area to

determine the extent of the deposit *mauka/makai* (north/south—perpendicular to the rail alignment axis).

The additional AIS testing at discoveries will be an iterative process. The focus will be to gather sufficient information to appropriately document the resource and to allow avoidance of the resource/discovery. Determining the geographic extent of the resource within the project footprint will be a primary concern. If engineering and subsequent testing quickly determine a means of avoidance, and sufficient information has been gathered to assess significance and project effect, then AIS testing at that location will be complete. As avoidance becomes more difficult based on project engineering, existing built environment constraints, and the results of additional testing, continued AIS testing may become necessary to find an appropriate design and engineering solution. Decisions will have to be made on a case-by-case basis. Project design/engineering constraints and flexibility at each location will play a large part in the decision-making process. SHPD and City input will be part of the process.

During implementation of the AIS fieldwork, the following procedures will be followed so that informed decisions can be made regarding additional testing in the vicinity of finds:

- A. Complete the proposed trenches outlined above in the discussion of the sampling strategy for general geographic areas. This will provide at least broad-brush information regarding archaeological cultural resource locations for that geographic area
- B. When archaeological resources are discovered, provide description and location information to project engineers and the SHPD
- C. For discoveries if *iwi kūpuna*, notify appropriate parties (e.g. the OIBC, NHOs, lineal and cultural descendents) following the consultation protocol for *iwi kūpuna*
- D. For the location of a find, consult GIS layers of existing utilities and the proposed project build out for that location based on preliminary engineering
- E. Consult project engineers about testing options and the flexibility of project design/engineering for that location
- F. Consult with the SHPD and ask for its input
- G. Design additional testing strategy in the vicinity of the find, focusing on areas that will be affected by project construction, including potential areas for project redesign to avoid the find, for example, a replacement column location
- H. Notify project engineers to obtain any additional permits and/or traffic control that may be needed for the additional testing
- I. Conduct additional testing
- J. Working with project engineers, compare testing results to preliminary engineering in that area to see if there is a design/engineering solution to avoid the find
- K. Evaluate whether there is sufficient information to describe, assess the significance, and determine the Project's effect on the find

- L. If a design/engineering solution is not found to avoid the find, and/or there is need for additional testing to document the find and assess its significance, repeat consultation steps above with GIS, engineers, and the SHPD
- M. Design and implement additional testing and reevaluate results in terms of a potential design or engineering solution to avoid the find
- N. Ensure sufficient information is available to evaluate the archaeological cultural resource's significance and the Project's effect on that resource
- O. If no design/engineering solution is available to avoid find, consider appropriate mitigation options, for example burial relocation or data recovery

The description and location information of a find will need to be disseminated quickly to the SHPD, consulting parties, and project engineers. With the estimated two to three months to complete the Airport AIS fieldwork, this additional AIS testing will need to follow somewhat soon after the discovery and initial documentation of a find. However, there will be time to consult and make considered decisions regarding additional AIS testing in the vicinity of finds.

The actual number and location of additional testing locations in these “no finds” areas will be decided on a case-by-case basis based on several factors, including: the surrounding existing built environment; the location – based on preliminary engineering – of project infrastructure that is planned for that area; and the type of evidence, for example a thick sand deposit, that has triggered the need for additional testing. In consultation with project engineers, an additional testing strategy will be designed in the vicinity to identify if archaeological cultural resources are present. This additional testing will focus on areas that will be affected by project construction based on preliminary engineering. The additional testing will be designed and carried out in consultation with the City and the SHPD. If archaeological cultural resources are found during additional AIS testing, the procedures outlined above will be followed.

9.2.2 Additional AIS Testing at Other Areas

The need for additional AIS testing may not be limited to areas where the proposed sampling strategy documents archaeological cultural resources. Additional testing may also be required in areas of no finds, but where excavation results for that area, for example the sediment types exposed, indicate more testing is required as part of the AIS identification effort.

9.3 Sampling Strategy Summary

This AISP is to serve as a framework to guide the archaeological inventory survey work. This section details the subsurface sampling strategy that will be the primary means of archaeological cultural resource inventory.

While a great deal of cultural history detail had been provided in the present plan that informs on the specific archaeological testing work proposed, lines of additional and/or more in-depth background research may be indicated as a result of specific finds. Specific finds may also call for a more detailed study of data presented in prior archaeological studies. This additional research will be part of the AIS report.

Some 40 specific locations for archaeological test excavations are proposed along the Airport Phase 3 corridor. While a good faith effort will be made to carry out these specific excavations it

is anticipated that a few of these specific proposed excavations will not be feasible for a variety of reasons, including current built environment constraints, public safety, and traffic management requirements. The SHPD will be kept in close consultation regarding any deviations from the terms of this plan and if more than 5% of the proposed excavations (i.e. three or more excavations) prove unfeasible then replacement locations for unfeasible excavations will be proposed. The SHPD will be kept abreast of unanticipated constraints and/or opportunities that may arise during the AIS fieldwork.

The proposed 40 specific locations for archaeological test excavations are regarded as an initial systematic sampling strategy. As described above, finds of human skeletal remains, and/or any other significant archaeological finds, and/or specific types of sediments will lead to additional testing. The anticipation is that additional test excavations will be undertaken within the project preliminary engineering footprint in the vicinity of areas that require additional investigation. Specific additional testing strategies will be developed in consultation with SHPD, the City, and project engineers.

Finds of human burials and disarticulated human skeletal remains in a disturbed context will require close consultation with the SHPD, the O'ahu Island Burial Council, cultural descendents, and other concerned Native Hawaiian Organizations.

It is anticipated that cultural resource finds encountered during the Airport AIS will merit mitigation in the form of data recovery programs, archaeological monitoring programs, and/or burial treatment plans.