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- TYPICAL TRENCH SECTIONS**
(N.T.S.)
- FOR AREAS OUTSIDE SHOULDER ON STATE HIGHWAY & ON SHOULDER OF EXIST'G KAHAKAI BLVD WITHIN STATE R.O.W.

1. THE CONTRACTOR SHALL OBTAIN A CONSTRUCTION PERMIT FROM THE STATE HIGHWAY DISTRICT ENGINEER AT 50 MAKALALA STREET PRIOR TO COMMENCEMENT OF WORK WITHIN THE STATE HIGHWAY RIGHT-OF-WAY.
2. CONSTRUCTION AND RESTORATION OF ALL EXISTING HIGHWAY FACILITIES WITHIN STATE RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE SECTIONS OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, "H" AND THE PRESCRIPTION FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, "F" OF THE STATE HIGHWAYS DIVISION.
3. ALL LINES SHALL BE OPENED TO TRAFFIC DURING THE MORNING PEAK HOURS FROM 6 AM TO 8 AM AND DURING THE AFTERNOON PEAK HOURS FROM 3:30 PM TO 5:30 PM AND DURING OFF-HOURS. ONLY ONE LANE OF THE HIGHWAY SHALL BE CLOSED AT ANY OTHER TIME.
4. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRIQUES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION AND FOR THE CONVENIENCE AND SAFETY OF PUBLIC TRAFFIC. ALL SUCH PROTECTIVE FACILITIES AND PRECAUTIONS TO BE TAKEN SHALL CONFORM WITH THE ADMINISTRATIVE RULES OF HAWAII GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION AND THE CURRENT U.S. FEDERAL HIGHWAY ADMINISTRATION TRAFFIC CONTROL TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI - TRAFFIC CONTROL FOR HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS." IF LANE CLOSURES ARE REQUIRED DURING CONSTRUCTION, A TRAFFIC CONTROL PLAN SHALL BE INCORPORATED INTO THE CONSTRUCTION PLANS AND MUST BE APPROVED BY THE DIVISION PRIOR TO THE ISSUANCE OF THE PERMIT.
5. THE MINIMUM PAVEMENT STRUCTURE SHALL CONSIST OF:
 - A. RESIDENTIAL DRIVEWAYS:
 - (1) 2" ASPHALT CONCRETE AND 6" AGGREGATE BASE COURSE, OR 2" ASPHALT CONCRETE AND 2-1/2" ASPHALT TREATED BASE COURSE OR ASPHALT CONCRETE.
 - (2) 6" OF CLASS "A" CONCRETE REINFORCED WITH 6" x 6" - 6/8 WIRE MESH ON 12" AGGREGATE SUBBASE IF DEEMED NECESSARY BY ENGINEER.
 - B. COMMERCIAL DRIVEWAYS, SIDEROADS AND UTILITY INSTALLATION ON MINOR HIGHWAYS:
 - (1) 2-1/2" ASPHALT CONCRETE, 6" AGGREGATE BASE COURSE AND 12" AGGREGATE SUBBASE, OR 2-1/2" ASPHALT CONCRETE AND 6" ASPHALT TREATED BASE COURSE OR ASPHALT CONCRETE.
 - (2) 6" OF CLASS "A" CONCRETE REINFORCED WITH 6" x 6" - 6/8 WIRE MESH ON 12" AGGREGATE SUBBASE IF DEEMED NECESSARY BY ENGINEER.
 - C. CHANNELIZED INTERSECTIONS AND UTILITY INSTALLATIONS ON MAJOR HIGHWAYS:
 - 4" ASPHALT CONCRETE, 6" AGGREGATE BASE COURSE AND 12" AGGREGATE SUBBASE, OR 4" ASPHALT CONCRETE AND 6" ASPHALT TREATED BASE COURSE OR ASPHALT CONCRETE, OR MATCH EXISTING PAVEMENT STRUCTURE, WHICHEVER IS GREATER.
6. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN HIGHWAY RIGHT-OF-WAY EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DISTRICT ENGINEER.
7. COMPACTION TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE "SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS," AS FOLLOWS:
 - A. SUBBASE: COMPACTION TEST(S) _____
 - B. BASE COURSE: COMPACTION TEST(S) _____
 - C. ONE COMPACTION TEST FOR EACH 500 LINEAL FEET OF TRENCH.
8. PRIOR TO COMMENCING TRENCH EXCAVATION WORK, THE CONTRACTOR SHALL TAKE A PROFILE ALONG THE NEW CENTERLINE OF THE UTILITY TRENCH. SUCH INFORMATION SHALL BE USED IN THE VERIFICATION OF RESTORING THE ROADWAY TO ITS ORIGINAL CONDITION. A COPY OF THE PROFILE SHALL BE SUBMITTED TO THE DISTRICT ENGINEER.
9. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ADEQUATE, SAFE, NON-SKID BRIDGING MATERIAL OFF THE TRENCH, INCLUDING SHORING, WHEN TRENCHING IN PAVEMENT AREAS TO HANDLE ALL TYPES OF VEHICULAR TRAFFIC.
10. NO TRENCH SHALL BE OPENED MORE THAN 500 FEET IN ADVANCE OF THE INSTALLED AND TESTED PIPE AND/OR DUCTLINE.
11. LONGITUDINAL DRAINAGE ALONG THE HIGHWAY SHALL BE MAINTAINED.
12. PAVEMENT STRIPING SHALL BE DONE BY THE CONTRACTOR.
13. APPROVAL OF PERMIT CONSTRUCTION PLANS SHALL BE VALID FOR A PERIOD OF ONE YEAR THEREOF FROM THE DATE OF NOTIFICATION OF APPROVAL TO THE APPLICANT. IN THE EVENT CONSTRUCTION DOES NOT COMMENCE WITHIN THIS ONE-YEAR PERIOD, THE APPLICANT WILL BE REQUIRED TO RESUBMIT HIS CONSTRUCTION PLANS FOR DIVISION'S REVISIONS, REVIEW AND APPROVAL.
14. ALL REGULATORY, GUIDE AND CONSTRUCTION SIGNS AND BARRICADES SHALL BE OF HIGH INTENSITY REFLECTION SHEETING.
15. ALL HIGHWAY STANDARD DETAILS SHALL BE REFERENCED TO THE DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION "STANDARD PLANS, 1986."

- WATERLINE NOTES**
1. ALL WORK SHALL CONFORM TO THE DEPARTMENT OF WATER SUPPLY "WATER SYSTEM STANDARDS," VOLUMES 1 AND 2, DATED 1985, AS AMENDED.
 2. THE CONTRACTOR SHALL INFORM THE D.N.S. ENGINEER 72 HOURS PRIOR TO THE BEGINNING OF ANY WATERLINE WORK AND TWO WEEKS PRIOR TO ANY CONNECTION, CHLORINATION, SHUT-OFF OR RELOCATION WORK.
 3. ALL WORK, EQUIPMENT AND MATERIAL FURNISHED BY THE D.N.S. SHALL BE PAID FOR BY THE CONTRACTOR.
 4. ALL EXISTING WATERLINES, WATERLINE APPURTENANCES AND OTHER UTILITIES LOCATIONS SHOWN ON THE PLANS ARE OBTAINED FROM LATEST RELIABLE SOURCES. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE EXACT LOCATION OF THE UTILITIES TO BE DELETED AND SHALL BEAR ALL COST FOR DAMAGES DONE DURING THE CONTRACT PERIOD.
 5. ALL CONNECTIONS TO EXISTING WATERLINES SHALL BE DONE BY D.N.S. CONTRACTOR SHALL PERFORM ALL EXCAVATION, BACKFILL, ROAD REPAIRS, TRAFFIC CONTROL, AND PROVIDE EQUIPMENT NECESSARY TO COMPLETE THE CONNECTION.
 6. WHERE WATER SHUT OFF OF MORE THAN 3 HOURS BECOMES NECESSARY, THE CONTRACTOR, AT HIS OWN COST, SHALL PROVIDE A TEMPORARY BY-PASS LINE. THE BY-PASS SIZE SHALL BE DETERMINED BY THE D.N.S. ENGINEER.
 7. MINIMUM HORIZONTAL CLEARANCE BETWEEN WATERLINES AND OTHER UTILITIES SHALL BE 8 FEET UNLESS OTHERWISE SPECIFIED. MINIMUM VERTICAL CLEARANCE BETWEEN WATERLINE AND OTHER UTILITIES SHALL BE 12" PROVIDED CONCRETE JACKETS ARE USED, AND 18" IF NO CONCRETE JACKETS ARE USED. IN ALL INSTANCES, THE WATERLINE SHALL BE AT A GRADE HIGHER THAN OTHER UTILITIES.
 8. ALL FITTINGS (CLASS 250) AND ALL GATE VALVES (CLASS 200) SHALL BE CAST IRON, WITH MECHANICAL JOINTS UNLESS OTHERWISE SPECIFIED.
 9. ALL PIPELINES, 4" AND LARGER IN DIAMETER, SHALL BE DUCTILE IRON, WITH JOINT CLASS 52, AND ALL PIPELINES SMALLER THAN 4" IN DIAMETER SHALL BE SOFT CORN, TYPE K, UNLESS OTHERWISE SPECIFIED.
 10. THE WATERLINE SHALL BE TESTED AT A MINIMUM OF 225 PSI, AT THE LOW POINT UNDER D.N.S. SUPERVISION.
 11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CHLORINATION OF THE WATER SYSTEM AND SHALL BEAR ALL COST. THE PERSON ENGAGED TO DO THE CHLORINATION WORK SHALL BE LICENSED BY THE STATE OF HAWAII AND APPROVED BY THE DEPARTMENT OF HEALTH.



Okahara & Associates Inc.
CONSULTING ENGINEERS

12" SUB@INTERSECTION OF NEW
PAHOA BY-PASS RD & KAHAKAI BLVD.
AS BUILT
PLAN & PROFILE, TYP. TRENCH SECTIONS, HORIZ. THURST
BULK DETAIL, NOTES

DRAWING NO.
89-088
SHEET NO.
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REVISION

C.O. 685-