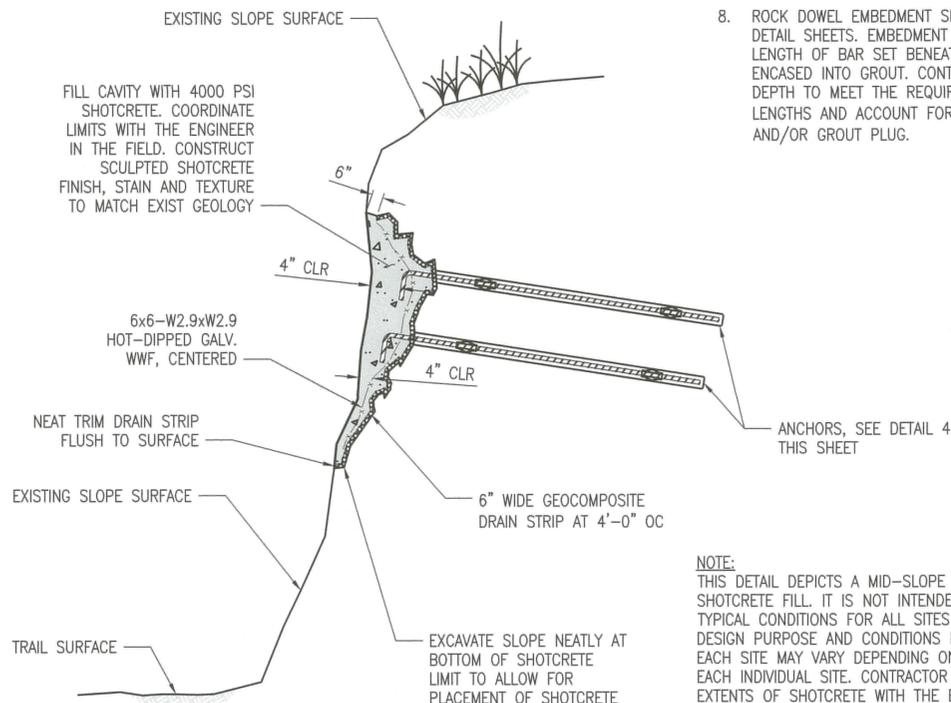


1 ROCK DOWEL
C-7 NOT TO SCALE

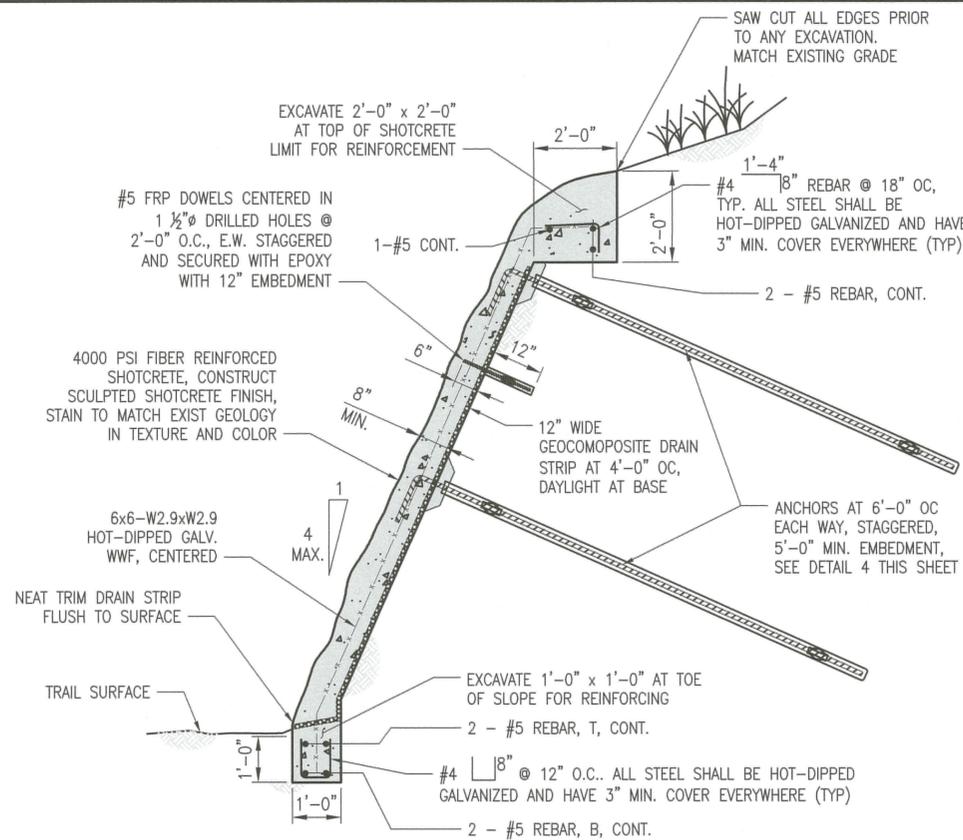
ROCK DOWEL NOTES:

- ALL ROCK DOWEL LOCATIONS AND ORIENTATIONS SHALL BE COORDINATED WITH THE ENGINEER PRIOR TO DRILLING. BORE HOLES DRILLED WITHOUT PRIOR APPROVAL FROM THE ENGINEER MAY BE REJECTED AT THE DISCRETION OF THE ENGINEER. REJECTED BORE HOLES SHALL BE FILLED WITH GROUT AND NEW HOLES SHALL BE DRILLED AT THE CONTRACTOR'S EXPENSE.
- UNLESS OTHERWISE SPECIFIED AND APPROVED IN WRITING BY THE ENGINEER, ALL BORE HOLES SHALL BE DRILLED USING A LOW IMPACT ROTARY DRILL TO PREVENT DAMAGE TO THE EXISTING SLOPE. AIR POWERED DRILLS ARE NOT ALLOWED. DAMAGE TO THE EXISTING SLOPE SHALL BE REPORTED TO THE ENGINEER FOR CORRECTIVE ACTION AT THE CONTRACTOR'S EXPENSE.
- ALL BORE HOLES SHALL BE CLEANED OUT USING COMPRESSED AIR PRIOR TO INSERTING THE DOWEL. ENGINEER RESERVES THE RIGHT TO WITNESS THE CLEANING PROCESS AND INSERTION OF DOWELS. CONTRACTOR SHALL NOTIFY THE ENGINEER IN ADVANCE OF CLEANING AND INSERTION OF DOWELS SO THAT DEPTH AND CLEANLINESS OF THE DRILLED HOLES CAN BE CONFIRMED. DOWELS GROUTED WITHOUT INSPECTION SHALL BE REJECTED AND REPLACED AT NO ADDITIONAL COST TO THE STATE.
- ALL ROCK DOWELS SHALL BE GROUTED IN THE PRESENCE OF THE ENGINEER. GROUTING PERFORMED WITHOUT THE ENGINEER PRESENT SHALL BE REJECTED AND THE ROCK DOWELS REPLACED AT THE CONTRACTOR'S EXPENSE.
- ALL ROCK DOWELS SHALL BE CENTERED IN THE DRILLED HOLE USING CENTRALIZERS. CONTRACTOR SHALL ADJUST CENTRALIZER SIZE ACCORDING TO DRILLED HOLE DIAMETER IF NECESSARY. ANY ROCK DOWEL NOT CENTERED SHALL BE REJECTED AND REPLACED AT THE CONTRACTOR'S EXPENSE. ANCHORS OR DOWELS SHALL NOT DEVIATE MORE THAN 8% OF THE DRILLED DIAMETER FROM THE CENTER OF THE HOLE. ALL DOWELS SHALL BE APPROVED PRIOR TO INSERTION OF CEMENT GROUT PLUG.
- CONTRACTOR SHALL KEEP THE AREA CLEAN DURING GROUTING. ANY SPILLED GROUT SHALL BE CLEANED IMMEDIATELY AT NO ADDITIONAL COST TO THE STATE.
- SURFACE GROUT SHALL BE SCULPTED AND STAINED TO MATCH EXISTING SURROUNDING COLOR, TEXTURE, AND SHAPE CONDITIONS.
- ROCK DOWEL EMBEDMENT SHALL BE AS SPECIFIED ON THE DETAIL SHEETS. EMBEDMENT LENGTH SHALL BE THE ACTUAL LENGTH OF BAR SET BENEATH THE SLOPE SURFACE AND ENCASED INTO GROUT. CONTRACTOR SHALL ADJUST THE DRILL DEPTH TO MEET THE REQUIRED MINIMUM EMBEDMENT LENGTHS AND ACCOUNT FOR TOP/BOTTOM CLEARANCE AND/OR GROUT PLUG.

NOTE:
THIS DETAIL DEPICTS A MID-SLOPE CAVITY THAT REQUIRES SHOTCRETE FILL. IT IS NOT INTENDED TO REPRESENT TYPICAL CONDITIONS FOR ALL SITES ON THESE PLANS. THE DESIGN PURPOSE AND CONDITIONS FOR SHOTCRETE AT EACH SITE MAY VARY DEPENDING ON THE CONDITIONS AT EACH INDIVIDUAL SITE. CONTRACTOR SHALL COORDINATE THE EXTENTS OF SHOTCRETE WITH THE ENGINEER IN THE FIELD.



3 SHOTCRETE SECTION - ISOLATED OUTCROP, TYP.
C-7 NOT TO SCALE



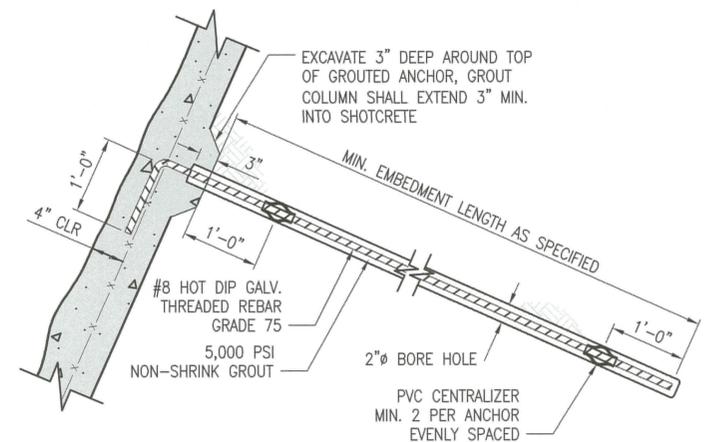
2 SHOTCRETE SECTION - FULL SLOPE, TYP.
C-7 NOT TO SCALE

ANCHOR BAR NOTES:

- ANCHOR BAR SHALL BE #8 GRADE 75 HOT DIP GALV. COATED (ASTM A-153).
- NUMBER OF ANCHORS AND EMBEDMENT LENGTHS SHALL BE AS SPECIFIED ON THE PLAN SHEETS C-3 THROUGH C-5.
- ANCHORS SHALL BE PROTECTED AT ALL TIMES FROM DAMAGE. ALL STEEL SHALL BE KEPT ON PALLETS AND HIGH ABOVE THE GROUND AND PROTECTED AS NOT TO ALLOW DAMAGE TO PROTECTIVE COATING. ALL STEEL SHALL BE NEW, FREE FROM DIRT, DETRIMENTAL SCALE, PAINT, OIL, OR OTHER SUBSTANCES.
- NO SHOTCRETE SHALL BE PLACED PRIOR TO THE INSPECTION AND APPROVAL OF SIZE, LENGTH, AND PLACEMENT OF ALL ANCHORS BY THE ENGINEER.
- CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO (2) WORKING DAYS OF ADVANCE NOTICE FOR THE ENGINEER TO INSPECT AND APPROVE THE PREPARATION WORK PRIOR TO SHOTCRETEING. IN ADDITION, THE CONTRACTOR SHALL ALLOW THE ENGINEER ONE (1) WORKING DAY TO COMPLETE INSPECTION OF SHOTCRETE AREA AND FOR THE CONTRACTOR TO MAKE THE NECESSARY CORRECTIONS PRIOR TO SHOTCRETE OPERATION.
- ANCHORS SHALL BE CENTERED IN THE DRILLED HOLE USING CENTRALIZERS. ANY ANCHOR NOT CENTERED SHALL BE REJECTED AND REPLACED AT THE CONTRACTOR'S EXPENSE. ANCHOR BAR SHALL NOT DEVIATE MORE THAN 8% OF THE DRILLED DIAMETER FROM THE CENTER OF THE HOLE.
- ALL BORE HOLES SHALL BE CLEANED OUT USING COMPRESSED AIR PRIOR TO INSERTING THE ANCHOR. ENGINEER RESERVES THE RIGHT TO WITNESS THE CLEANING PROCESS AND INSERTION OF ANCHORS. CONTRACTOR SHALL NOTIFY THE ENGINEER IN ADVANCE OF CLEANING AND INSERTION OF ANCHORS SO THAT DEPTH AND CLEANLINESS OF THE DRILLED HOLES CAN BE CONFIRMED. ANCHORS GROUTED WITHOUT INSPECTION SHALL BE REJECTED AND REPLACED AT NO ADDITIONAL COST TO THE STATE.
- ALL GROUTING SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER. GROUTING PERFORMED WITHOUT THE ENGINEER PRESENT SHALL BE REJECTED AND THE ANCHORS REPLACED AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL KEEP THE AREA CLEAN DURING GROUTING. ANY SPILLED GROUT SHALL BE CLEANED IMMEDIATELY AT NO ADDITIONAL COST TO THE STATE. IN ADDITION, AREAS ADJACENT TO SHOTCRETE AREAS MUST BE PROTECTED FROM STAINING AND OTHER DAMAGES USING PLASTIC SHEETS AND OTHER METHODS FOR PROTECTION AGAINST STAINING AND DAMAGE.
- CONTRACTOR SHALL COORDINATE ANCHOR LAYOUT AND DRILLING ORIENTATION OF EACH ANCHOR WITH THE ENGINEER IN THE FIELD PRIOR TO DRILLING. ANCHORS INSTALLED WITHOUT PRIOR APPROVAL FROM THE ENGINEER SHALL BE REJECTED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

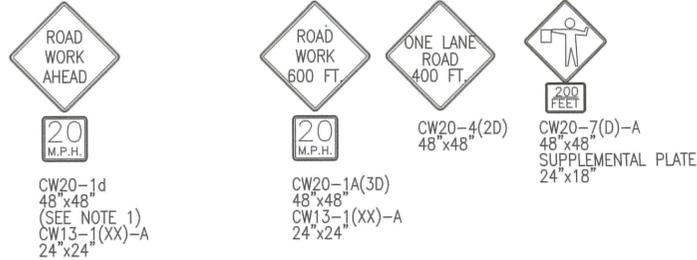
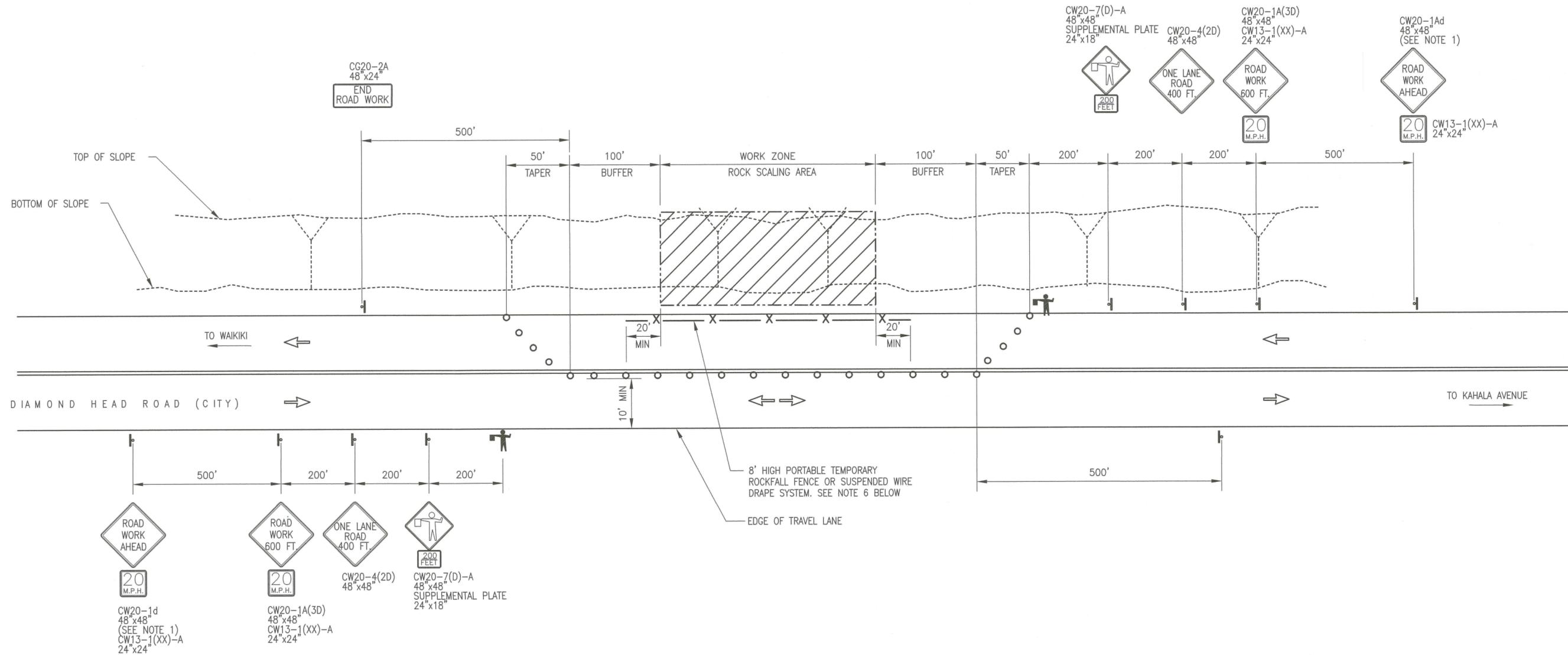
SHOTCRETE NOTES:

- SHOTCRETE LIMITS SHOWN ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE ACTUAL SHOTCRETE LIMITS WITH THE ENGINEER IN THE FIELD PRIOR TO STARTING WORK.
- CONTRACTOR SHALL CLEAN SHOTCRETE AREA OF DIRT, DEBRIS, VEGETATION AND ALL LOOSE MATERIAL PRIOR TO INSTALLING SHOTCRETE AT NO ADDITIONAL COST TO THE STATE. SHOTCRETE AREA SHALL BE MARKED BY THE CONTRACTOR AND INSPECTED AND APPROVED BY THE ENGINEER PRIOR TO SHOTCRETE OPERATION.
- WELDED WIRE FABRIC WWF 6x6-W2.9xW2.9 SHALL BE HOT-DIPPED GALVANIZED AND SHALL BE INSTALLED WITH SHOTCRETE AND AS REQUIRED BY SHOTCRETE OPERATION IN THE FIELD AT NO ADDITIONAL COST TO THE STATE. WIRE REINFORCING SHALL NOT BE IN CONTACT WITH THE SLOPE SURFACE. CONCRETE SPACERS SHALL BE USED TO MAINTAIN A MINIMUM DISTANCE OF 3 INCHES BETWEEN MESH AND SLOPE.
- ALL METAL COMPONENTS (EXCEPT FOR THOSE SPECIFIED AS SS) SHALL BE HOT DIP GALVANIZED.
- CONTRACTOR SHALL INSTALL GEOCOMPOSITE DRAIN PER MANUFACTURER'S RECOMMENDATIONS. UPON INSTALLATION, DRAINS SHALL BE INSPECTED AND APPROVED BY THE ENGINEER PRIOR TO BEING COVERED.
- ALL REINFORCING STEEL SHALL HAVE 3 INCHES OF MINIMUM COVER EVERYWHERE, TYPICAL.
- SHOTCRETE WORK SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER. ANY SHOTCRETE PLACED WITHOUT THE ENGINEER PRESENT SHALL BE REJECTED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL PROTECT THE TRAIL AND ADJACENT ROCKS DURING SHOTCRETE OPERATIONS FROM OVER-SPRAY AND/OR SPILLS. SHOTCRETE SPILLED OUTSIDE OF THE DESIGNATED SHOTCRETE LIMITS SHALL BE CLEANED IMMEDIATELY AT NO ADDITION COST TO THE STATE.
- AREAS NOT TO BE SHOTCRETED SHALL BE COVERED FOR PROTECTION AND SHALL BE CLEANED IMMEDIATELY AFTER ACCIDENTAL SPRAYING.
- SEE SPECIFICATIONS FOR FURTHER DETAILS REGARDING SHOTCRETE, GROUTED DOWELS, GROUTED ANCHORS, ETC.



4 ANCHOR DETAIL, TYP.
C-7 NOT TO SCALE

REVISION NO.	SYMBOL	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION DIAMOND HEAD STATE MONUMENT ROCKFALL MITIGATION, PHASE 2 (FY2015) HONOLULU, OAHU, HAWAII TYPICAL DETAILS					
DESIGNED: ARN/YP		SUBMITTED: [Signature]		DATE: MAY 2016	
DRAWN: RTN		CHECKED: ARN		SCALE: AS NOTED	
APPROVED: [Signature]		CHIEF ENGINEER		DATE: MAY - 9 2016	
Signature		Expiration Date of the License		DRAWING NO. C-7	



NOTES:

- "ONE LANE ROAD" (CW20-4) AND "FLAGGER AHEAD" (CW20-7) SIGNS SHALL BE REMOVED OR COVERED WHEN NO WORK IS BEING PERFORMED AND LANE IS NOT CLOSED.
- THE BUFFER SPACE SHOULD BE EXTENDED SO THAT THE TWO-WAY TRAFFIC TAPER IS PLACED BEFORE A HORIZONTAL (OR CREST VERTICAL) CURVE TO PROVIDE ADEQUATE SIGHT DISTANCE FOR THE FLAGGER AND A QUEUE OF STOPPED VEHICLES.
- CONES OR DELINEATORS SHALL BE INSTALLED AT 20' O.C. MAX. ON TAPERS AND 25' O.C. MAX. FOR BUFFER AND WORK AREAS.
- OPTIONAL 'BE PREPARED TO STOP' SIGN SHOULD BE LOCATED BETWEEN THE FLAGGER SIGN AND THE 'ONE LANE ROAD' SIGN.
- EXCEPT IN EMERGENCIES, ILLUMINATE FLAGGER STATIONS AT NIGHT.
- PROTECT THE HIGHWAY SURFACE AND PUBLIC DURING ROCK SCALING OPERATIONS BY MEANS OF TEMPORARY FENCE, PORTABLE CONCRETE BARRIERS, AND/OR STEEL PLATING (INCIDENTAL TO TRAFFIC CONTROL). SUBMIT ALL LITERATURE INCLUDING MATERIALS, EQUIPMENT, ETC TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO STARTING WORK.
- CONTRACTOR SHALL SUBMIT TRAFFIC CONTROL PLAN FOR REVIEW AND APPROVAL PRIOR TO STARTING ANY WORK. ROAD CLOSURES SHALL NOT TAKE PLACE WITHOUT AN APPROVED TRAFFIC CONTROL PLAN.

1 TRAFFIC CONTROL PLAN – DIAMOND HEAD ROAD
C-8 NOT TO SCALE

LEGEND

- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- FLAGGER / POLICE OFFICER
- WORK AREA

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION DIAMOND HEAD STATE MONUMENT ROCKFALL MITIGATION, PHASE 2 (FY2015) HONOLULU, OAHU, HAWAII TRAFFIC CONTROL PLAN					
		DESIGNED: ARN/YP DRAWN: RTN CHECKED: ARN APPROVED:			
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.		SUBMITTED: DATE: MAY 2016 SCALE: AS NOTED		DRAWING NO. C-8	
Signature: Expiration Date of License: 4/30/18		CHIEF ENGINEER		DATE: MAY - 9 2016	