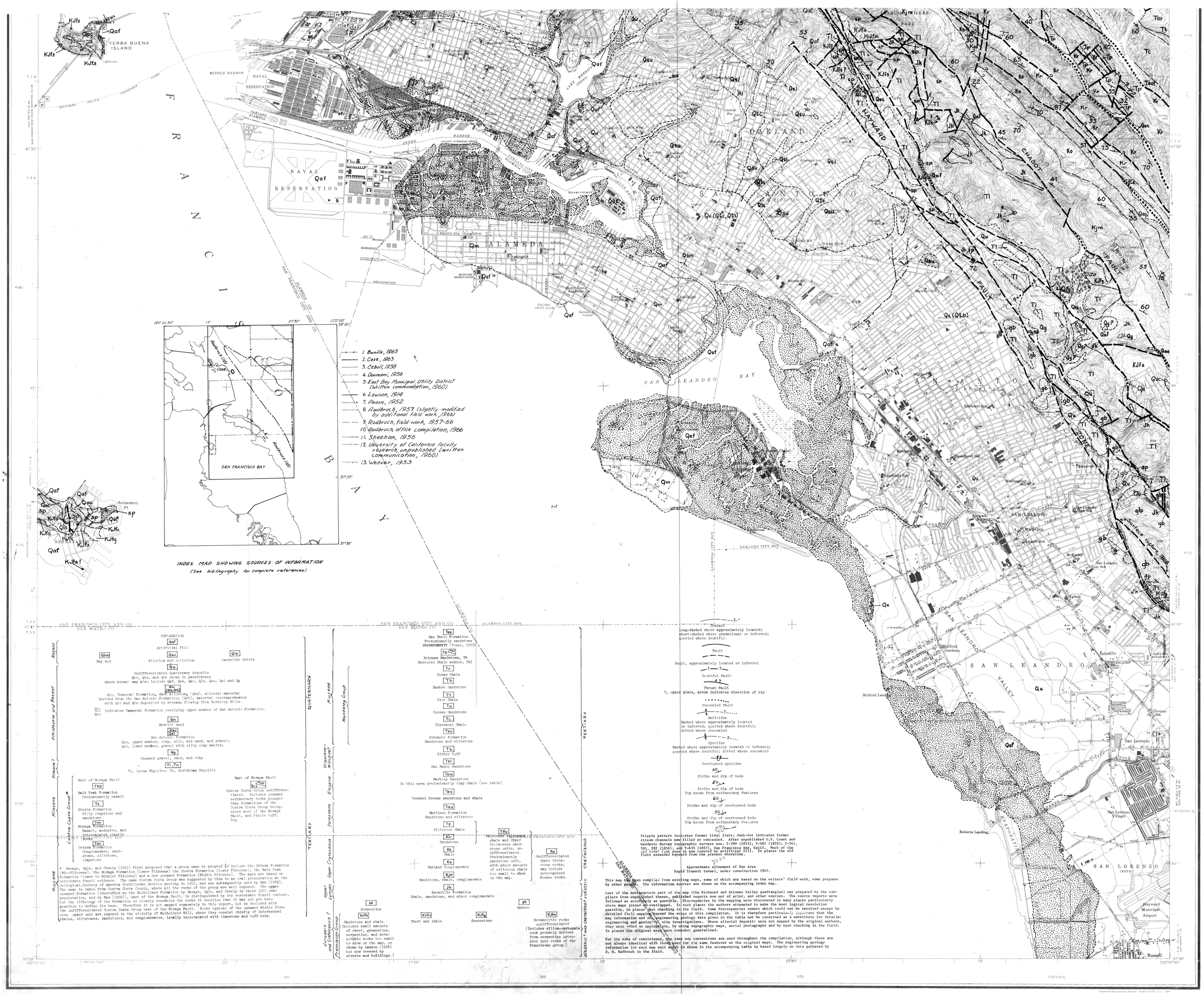
YERBA BUENA ISLAND
NAVAL RESERVATION
ALAMEDA
OAKLAND
SAN ANTONIO
SAN LEANDRO BAY
SAN LEANDRO
SAN LORENZO
HAYWARD FAULT
CHABOT FAULT
SAN FRANCISCO BAY
INDEX MAP SHOWING SOURCES OF INFORMATION
(See bibliography for complete references)
1. Bonilla, 1965
2. Case, 1963
3. Cebull, 1958
4. Doumani, 1956
5. East Bay Municipal Utility District (written communication, 1960)
6. Lawson, 1914
7. Pease, 1952
8. Radbruch, 1957 (slightly modified by additional field work, 1966)
9. Radbruch, field work, 1957-66
10. Radbruch, office compilation, 1966
11. Sheehan, 1956
12. University of California faculty research, unpublished (written communication, 1960)
13. Weaver, 1953
EXPLANATION
Qaf
Artificial fill
Qbm
Bay mud
Qac
Alluvium and colluvium
Qls
Landslide debris
Qu
Undifferentiated Quaternary deposits
Qtc, Qts, and Qtb shown in parentheses where known; may also include Qmf, Qbm, Qac, Qls, Qsu, Qsl and Qg
Qtc (Qts, Qtb)
Qtc, Temescal Formation, dark alluvium; (Qts), alluvial material derived from the San Antonio Formation; (Qtb), material contemporaneous with Qtc and Qts deposited by streams flowing from Berkeley Hills.
Qtc Qsu
indicates Temescal Formation overlying upper member of San Antonio Formation.
Qm
Merritt sand
Qsu Qsl
San Antonio Formation
Qsu, upper member, clay, silt, and sand, and gravel;
Qsl, lower member, gravel with silty clay matrix.
Qg
Unnamed gravel, sand, and clay
Tl, Tn
Tl, Leona Rhyolite; Tn, Northbrae Rhyolite
Tbp
Bald Peak Formation
Predominantly basalt
Ts
Siesta Formation
Silty claystone and sandstone
Tm
Moraga Formation
Basalt, andesite, and intercalated clastic rocks
Tor
Orinda Formation
Conglomerate, sandstone, siltstone, claystone
West of Moraga fault
East of Moraga fault
Tcp
Contra Costa Group undifferentiated. Includes unnamed sedimentary rocks younger than formations of the Contra Costa Group recognized west of the Moraga fault, and Pinole tuff, Tcp.
Contra Costa Group *
* Savage, Ogle, and Creely (1951) first proposed that a group name be adopted to include the Orinda Formation (Mio-Pliocene), the Moraga Formation (Lower Pliocene), the Siesta Formation (Lower Pliocene), the Bald Peak Formation (Lower to Middle Pliocene) and a new unnamed formation (Middle Pliocene). The ages are based on vertebrate fossil evidence. The name Contra Costa Group was suggested by them in an oral presentation at the Geological Society of America Cordilleran Section meeting in 1951, and was subsequently used by Bam (1952). The name is taken from Contra Costa County, where all the rocks of the group are well exposed. The upper unnamed formation (identified as the Malholland Formation by Savage, Ogle, and Creely in their 1951 oral presentation, and by Bam (1952)), east of the Moraga fault, is distinguished by its vertebrate fossil content, but the lithology of the formation so closely resembles the rocks it overlies that it has not yet been possible to define its base. Therefore it is not mapped separately in this report, but is included with the undifferentiated Contra Costa Group east of the Moraga Fault. Rocks typical of the unnamed Middle Pliocene upper unit are exposed in the vicinity of Malholland Hill, where they consist chiefly of interbedded shales, siltstones, sandstones, and conglomerates, locally intercalated with limestone and tuff beds.
Tsp
San Pablo Formation
Predominantly sandstone
UNCONFORMITY (Thomas, 1953)
Tb Th
Briones Sandstone, Tb
Hercules Shale member, Thl
Tr
Rodeo Shale
Tfh
Hambre Sandstone
Tt
Tice Shale
To
Orinda Sandstone
Tc
Claremont Shale
Tsc
Sobrante Formation
Sandstone and siltstone
Tk
Kirker Tuff
Tsr
San Ramon Sandstone
Tcm
Markley Sandstone
In this area predominantly clay shale (see table)
Tes
Unnamed Eocene sandstone and shale
Tnz
Martinez Formation
Sandstone and siltstone
Tp
Siliceous Shale
Kr
Sandstone
Ks
Shale
Ko
Oakland Conglomerate
Kjm
Sandstone, shale, conglomerate
Jk
Knoxville Formation
Shale, sandstone, and minor conglomerate
TKu
Undifferentiated Upper Cretaceous rocks; may include unrecognized Eocene rocks.
sp
Serpentine
KJfs
Sandstone and shale
Includes small amounts of chert, greenstone, serpentine, and metamorphic rocks too small to show on the map, or shown by Lawson (1914) but now covered by streets and buildings.)
KJfc
Chert and shale
KJfg
Greenstone
gb
Gabbro
KJfm
Metamorphic rocks undifferentiated
(Includes silica-carbonate rock probably derived from serpentine intrusive into rocks of the Franciscan group.)
Contact
Long-dashed where approximately located; short-dashed where gradational or inferred; queried where doubtful.
Fault
Fault, approximately located or inferred
Doubtful fault
Thrust fault
T, upper plate, arrow indicates direction of dip
Concealed fault
Anticline
Dashed where approximately located or inferred; queried where doubtful; dotted where concealed
Syncline
Dashed where approximately located or inferred; queried where doubtful; dotted where concealed
Overturned syncline
Strike and dip of beds
Strike and dip of beds
Top known from sedimentary features
Strike and dip of overturned beds
Strike and dip of overturned beds
Top known from sedimentary features
Stipple pattern indicates former tidal flats; dash-dot indicates former stream channels now filled or concealed. After unpublished U.S. Coast and Geodetic Survey topographic surveys nos. T-399 (1853); T-481 (1855); T-561, 591, 592 (1856); and T-635 (1857), San Francisco Bay, Calif. Much of the old tidal flat area is now covered by artificial fill. In places the old flats extended bayward from the present shoreline.
Approximate alinement of Bay Area Rapid Transit tunnel, under construction 1967.
This map has been compiled from existing maps, some of which are based on the writers' field work, some prepared by other people. The information sources are shown on the accompanying index map.
Most of the northeastern part of the map (the Richmond and Briones Valley quadrangles) was prepared by the compilers from unpublished theses, published reports now out of print, and other sources. The source reports were followed as accurately as possible. Discrepancies in the mapping were discovered in many places particularly where maps joined or overlapped. In such places the authors attempted to make the most logical resolution possible, in places just checking in the field. Some discrepancies remain which could not be resolved except by detailed field mapping beyond the scope of this compilation. It is therefore particularly important that the map information and the engineering geology data given in the table not be construed as a substitute for detailed engineering and geological site investigations. Where alluvial deposits were not mapped by the original authors, they were added as appropriate, by using topographic maps, aerial photographs and by spot checking in the field. In places the original maps were somewhat generalized.
For the sake of consistency, the same map conventions are used throughout the compilation, although these are not always identical with those used for the same features on the original maps. The engineering geology information for each map unit which is shown in the accompanying table is based largely on data gathered by D. H. Radbruch in the field.
Mapped, edited, and published by the Geological Survey
Control by USGS, USC&GS, and US Army
Compiled from 1:24 000 scale maps of the Briones Valley 1947, Richmond 1947, Oakland West 1947, Oakland East 1947, San Leandro 1947, and San Francisco S. 1947 7.5 minute quadrangles
Polyconic projection. 1927 North American datum
10 000 foot grid based on California coordinate system, zone 3
Red tint indicates area in which only landmark buildings are shown
Dashed land lines indicate approximate location
1,000-meter Universal Transverse Mercator grid, zone 10, ticked by blue dotted ticks outside the neatline
APPROXIMATE MEAN DECLINATION, 1947
SCALE 1:24000
CONTOUR INTERVALS 5 AND 25 FEET WITH SUPPLEMENTARY CONTOURS AT 5 FOOT INTERVAL
DATUM IS MEAN SEA LEVEL
CONTOUR INTERVAL DIAGRAM
INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1967
Compiled 1965-66
ROAD CLASSIFICATION
Heavy-duty
Light-duty
Medium-duty
Unimproved dirt
U. S. Route
State Route
OAKLAND AND VICINITY, CALIF.
N3739—W12207.5/21x15
1947
OPEN-FILE REPORT
PRELIMINARY GEOLOGIC MAP AND ENGINEERING GEOLOGIC INFORMATION, OAKLAND AND VICINITY, CALIF.
DORTHY RADBRUCH & J.E. CASE, 1967
This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.