DensityHhTable

Density	% Single Family	Household per Multi Unit Dwelling	% Multi Family Dwellings
0	96.00%	2.80	4.00%
11	93.90%	3.20	6.10%
51	89.00%	4.50	11.00%
151	83.40%	5.20	16.60%
501	74.20%	5.70	25.80%
2001	59.40%	5.90	40.60%
5001	22.00%	7.10	78.00%

This table determines the mix of single family and multi-family dwelling units by density group. The Table also contains the average number of units in each multi-family dwelling unit by density group. The default values were derived from the census bureau national survey of housing characteristics. This table is used to determine an accurate size and mix of drop, nid, and terminal investments.

Structure Allocation Table

Cable Size	Cable Structure %	Fiber Structure %
0	50.00%	50.00%
200	50.00%	50.00%
900	50.00%	50.00%
2400	50.00%	50.00%
4200	50.00%	50.00%
>4200	75.00%	25.00%

This table determines the allocation of structure costs (trench, poles) between copper and fiber facilities when both are present.

Voice Grade Ratio Table

# switched lines in CBG	% switched to VG	% switched to DS1	% special to VG	% special to DS1
0	100.00%	0.00%	100.00%	0.00%
2,016	65.00%	35.00%	50.00%	50.00%
10,000	50.00%	50.00%	30.00%	70.00%
20,000	75.00%	25.00%	10.00%	90.00%

This table is used to determine the percent of switched voice grade lines that are terminated in a CBG at a digital PBX via DS1 facilities. This table also is used to determine the percent of private line voice grade channels that are terminated at the DS1 level at the customer premise.

Structure Costs

	Density Group 0-10						
	Underground Normal						
Density Group 0-10	**Install**	**Feeder**			**Distribution**		
Conduit Installation	Cost per Unit	% of Activity	% Assigned Telephone	Weighted Amount	% of Activity	% Assigned Telephone	Weighted Amount
Trench & Backfill	$ 2.27	75.00%	100.00%	$1.70	87.00%	100.00%	$1.97
Rocky Trench	$ 4.22	0.00%	100.00%	$0.00	0.00%	100.00%	$0.00
Backhoe Trench	$ 2.70	17.00%	100.00%	$0.46	5.00%	100.00%	$0.14
Hand Dig Trench	$ 4.99	2.00%	100.00%	$0.10	2.00%	100.00%	$0.10
Boring	$ 11.80	2.00%	100.00%	$0.24	2.00%	100.00%	$0.24
Cut & Restore Asphalt	$ 8.72	1.00%	100.00%	$0.09	1.00%	100.00%	$0.09
Cut & Restore Concrete	$ 9.63	1.00%	100.00%	$0.10	1.00%	100.00%	$0.10
Cut & Restore Sod	$ 3.75	2.00%	100.00%	$0.08	2.00%	100.00%	$0.08
Total Underground Cost per Foot		100.00%		$2.76	100.00%		$2.70

	Buried Normal						
	Install	**Feeder**			**Distribution**		
Buried Cable Installation	Cost	% of Activity	% Assigned Telephone	Weighted Amount	% of Activity	% Assigned Telephone	Weighted Amount
Plow	$ 1.14	96.00%	100.00%	$ 1.09	86.00%	100.00%	$ 0.98
Rocky Plow	$ 1.37	0.00%	100.00%	$ 0.00	0.00%	100.00%	$ 0.00
Trench & Backfill	$ 2.27	0.00%	100.00%	$ 0.00	10.00%	100.00%	$ 0.23
Rocky Trench	$ 4.22	0.00%	100.00%	$ 0.00	0.00%	100.00%	$ 0.00
Backhoe Trench	$ 2.70	0.00%	100.00%	$ 0.00	0.00%	100.00%	$ 0.00
Hand Dig Trench	$ 4.99	0.00%	100.00%	$ 0.00	0.00%	100.00%	$ 0.00
Bore Cable	$ 11.80	0.00%	100.00%	$ 0.00	0.00%	100.00%	$ 0.00
Push Pipe & Pull Cable	$ 6.80	0.00%	100.00%	$ 0.00	0.00%	100.00%	$ 0.00
Cut & Restore Asphalt	$ 8.72	1.00%	100.00%	$ 0.09	1.00%	100.00%	$ 0.09
Cut & Restore Concrete	$ 9.63	1.00%	100.00%	$ 0.10	1.00%	100.00%	$ 0.10
Cut & Restore Sod	$ 3.75	2.00%	100.00%	$ 0.08	2.00%	100.00%	$ 0.08
Total Buried Cost per Foot		100.00%		$ 1.35	100.00%		$ 1.47

		Aerial Normal					
		Feeder			**Distribution**		
Aerial Cable Installation	Cost	Installation Cost per Unit	% of Sharing	Weighted Amount	Installation Cost per Unit	% of Sharing	Weighted Amount
Poles	$ 68.17	$ 358.58	50.00%	$ 363.38	$ 358.58	50.00%	$ 363.38

Anchors and Guys	$ 68.00	$ 255.00	100.00%	$ 53.83	$ 255.00	100.00%	$ 53.83
Total Aerial Cost per Pole				$ 417.21			$ 417.21

Structure type and costs vary by type of facilities (aerial, buried, or underground), density, and soil conditions (Normal, Soft Rock, and Hard Rock). Trench cost for both conduit and buried cable is averaged from the forward looking cost data received from data requests. LECs provided data for the cost of different types of trenching done in each of the density zones and for the different types of soil conditions. This information was weighted and averaged for the trenching default cost in the BCPM. Sharing of trench is assumed in both feeder and distribution but the amount of sharing differs by density and feeder/distribution. It would be extremely rare that LECs would share trench in feeder conduit system or in rural areas where other service providers choose not to serve. The poles placed in the BCPM are 45' class 5 poles, purchased and placed by the telephone company. Sharing is considered with poles but not anchors and guys as they are placed per messenger. Anchors and guys are assumed to occur every 1000 feet so their costs are calculated on a per foot basis then added to the cost of poles.

Conduit Manhole Table

Duct capacity in manhole	Unit	Per Unit Material Cost	Installation Cost Per Unit		
			Normal	Soft Rock	Hard Rock
0	Hand Hole	$ 944.00	$ 400.00	$ 600.00	$ 800.00
3	4X Manhole	$ 2,138.25	$ 1,645.00	$ 2,045.00	$ 2,445.00
5	9X Manhole	$ 3,209.00	$ 2,431.00	$ 2,831.00	$ 3,231.00
99	9X Adder	$ 2,800.00	$ 500.00	$ 700.00	$ 900.00
n/a	Conduit per duct foot	$0.83	NA	NA	NA

Conduit Manhole Table (Continued)

% Assigned Telephone	Cost of installed facility assigned telephone		
	Normal	Soft Rock	Hard Rock
75%	$ 1,344.00	$ 1,544.00	$ 1,744.00
90%	$ 3,783.25	$ 4,183.25	$ 4,583.25
80%	$ 5,640.00	$ 6,040.00	$ 6,440.00
80%	$ 3,300.00	$ 3,500.00	$ 3,700.00
100.00%	$ 0.83	NA	NA

Sizing of conduit and manholes are based on the required amount of facilities required for telephony. No additional capacity has been added for sharing. For example, if a placement of 3 copper cables are required then 3 ducts are placed for the cables and one duct is placed for maintenance. In this case, a pre-cast manhole (PTS-65) is placed with 4 ducts. Manhole costs and duct cost per foot was averaged from the data provided by participating LECs.

Spacing Table

In Feet

Density	Manhole Spacing	Pole Spacing	Guy Spacing	Relative Pole Units
0	725	250	1500	6.00
11	725	250	1500	6.00
51	725	250	1500	6.00
151	725	250	1500	6.00
501	550	150	1000	6.67
2001	550	150	500	3.33
5001	550	150	500	3.33

Manhole and pole spacing defaults are established by averaging the spacing data provided by the LECs. Denser areas (above 501 households per square mile) require shorter spacing due to larger cables and demand. Larger cables, due to their weight, will sag more in midspan between poles and increase pulling tension for pulls between manholes.

Miscellaneous Inputs

Cable & Wire Inputs		**Description**
NormalUGDepth	24.00	Normal Placement Depth in inches for Buried/Underground Copper Cable
NormalFiberDepth	36.00	Normal Placement Depth in inches for Buried/Underground Fiber
MaxFiberSize	288	Maximum Fiber Cable Size
MaxFeederSize	4,200	Maximum Copper Feeder Cable Size
Max DistSize	3,600	Maximum Copper Distribution Cable Size
CprMaxDistr	12,000	Maximum length of copper cable in the CBG distribution area
	0.00%	Fiber Cable Discount %
	0.00%	Copper Cable Discount %
DropCostPerFoot	$0.77	Drop Cost per Foot Material & Installation
PedestalCost	$0.00	Cost of Pedestal included in Drop Terminal Cost
NidCost	$30.73	Unit Cost per Network Interface Device Including Installation
	12,000	Cable Break Point

Cable and wire inputs set the parameters for cable placement depth, cable maximum sizes and the amount of discount applied to cable. To set the default values for Drop and NID, the data responses provided by the participating LECs was averaged to determine a national average installed cost for each. The travel and installation labor hours are adjusted to account for installing more than one unit per trip per 8 hour workday. Fiber and copper default discounts are set as 0% as discounts are already applied to the data received from LECs. To apply additional discounts to cable in this table, a user should adjust the total amount of the discount to account for the inclusion of labor in the cable cost tables. The default value for the Cable Break Point is set at 12,000 feet total loop distance (wire center to subscriber). However, breakpoints ranging from 6000 feet to 18,000 feet are available on the pull down menu for users to set their own or for sensitivity

analysis. The 12,000 foot default is designed to allow for provisioning of services up to and including DS1. To extend the breakpoint, a user must adjust cable cost to account for additional provisioning cost (load coils, repeaters, etc. depending on service) and gauge changes in cables in the feeder **and** distribution.

Terrain Inputs and Surface Impacts

CriticalWaterDepth	3	Depth in feet at which water impacts placement costs
WaterFactor	30.00%	% Cost increase for presence of water within critical depth
NewTerrainTrigger	5	Value that triggers new terrain variable multiplier
NewTerrainFactor	1	Cost multiplier when new terrain variable exceeds trigger point
MinSlopeTrigger	12	Point at which minimum slope effects placement distance
MinSlopeFactor	1.100	Change in distance due to increased average slope
MaxSlopeTrigger	30	Point where presence of very high slope causes yet more cable distance
MaxSlopeFactor	1.0500	Change in distance due to a maximum only slope presence
CombSlopeFactor	1.200	Secondary change in distance due to substantial slope presence

Slope Triggers are set at the percent slope when facilities must be placed along the contours of the hillside rather than in a point-to-point placement. The Slope Factors are the multipliers used to add the additional distance that the facilities must travel as they wind their way across the higher slope terrain. Three different Slope Triggers are used to adjust distance: 1) the minimum slope trigger: when the average minimum slope in the CBG exceeds 12 degrees (default) then distance is adjusted by this minimum slope factor, 2) the maximum slope trigger: when the average maximum slope in the CBG exceeds 30 degrees (defaults) the distance is adjusted by this maximum slope factor, 3) the combined slope trigger: when both the minimum and maximum slope triggers are exceeded the distance is adjusted by the combined slope factor.

Digital Carrier Inputs

OpticsCost	$75,000	Average Cost for each DS-3 for CO and field DS3 to DS1 multiplexers
CopperT1	$2,500	Average Cost per DS-1 on copper (both terminals & repeater)
ElectronicFill	85.00%	Fill Factors for Electronics
HiCapFill	95.00%	Fill Factors for High Capacity Optic Multiplexers
	0.00%	AFC Electronics Discount %
	0.00%	SLC Electronics Discount %

This table provides the cost of electronics for terminating private line and digital PBX services at the DS1 signal level. The table also includes the fill factors that applies to the line cards in the channel units.

Computation of Weighted Average Cost Inputs to BCPM

The following companies have provided data. Selected data outliers were excluded:

Alltel	Ameritech
Bell Atlantic	Bell South
Pacific Bell	Pacific Telecom Inc.
Sprint LECs	U S West

The BCPM Expense Work Group developed the methods described below to compute nationwide average expense relationships for input the BCPM.

Expense Per Line Development

The weighted nationwide expense per line averages were computed at the Class B level of detail using 1995 USF loop counts from the original 1996 Annual USF Filing. A future enhancement will introduce small company multipliers to recognize their relatively higher expense per line.

Capital Cost Factor Development

The nationwide weighted averages for input to the Capital Cost Module were computed using ARMIS 43-03 1995 TPIS, Line 2001, amounts for companies filing ARMIS data and 1995 Cost Study TPIS results for Alltel and Pacific Telecom Inc. The weighted average Gross Receipts Tax was computed using Gross Revenue on the ARMIS 43-03, Line 530, Regulated Net Revenue, + Line 5300, Regulated Uncollectible Revenue for ARMIS reporting companies and the 1995 cost study revenue requirement for Alltel and PTI. In both cases, regulated and unseparated levels were used to obtain the weightings.

BCPM Expense Inputs

Following are the nationwide Expense Per Line defaults used in BCPM:

Account	Description	Amount
6110	Network Support Expense	$ 0.148794
6120	General Support Expense	$ 1.200445
6210	Central Office Switching Expense	$ 0.338671
6220	Operator Systems Expense	$ 0.008802
6230	Central Office Transmission Exp.	$ 0.231453
6310	Information Orig./Term Expense	$ 0.066888
6410	Cable & Wire Facilities Expense	$ 2.759393
6510	Other Property Plant & Equip. Exp.	$ 0.030168
6530	Network Operations Expense	$ 1.332774
6540	Access Expense	$ 0.000000
6610	Marketing Expense	$ 0.354032
6620	Services Expense	$ 2.421876
6710	Executive and Planning Expense	$ 0.136868
6720	General and Administrative Exp.	$ 2.145629
6790	Provision for Uncollectibles	$ 0.169785
	Monthly Weighted Total Expense	$ 11.345578
	Annual Weighted Total Expense	$136.146936

Following are the nationwide Capital Cost defaults used in BCPM:

Cost of Equity	13.1150%
Debt Ratio	32.8216%
Cost of Debt	7.8489%
Cost of Capital	11.3866%
Composite Tax Rate (FIT + SIT)	38.8423%
State Income Tax Rate	6.6979%
Gross Receipts Tax Rate	3.8677%

	Depr. Life	Cost of Removal	Salvage Value
Poles	30.05	92.3858%	3.2931%
Conduit	52.79	10.4324%	5.5086%
Undergrnd Copper	11.37	20.0057%	12.3972%
Aerial Copper	12.49	25.4753%	7.5531%
Buried Copper	14.10	7.4467%	1.1604%
Undergrnd Fiber	18.94	16.6145%	0.0224%
Aerial Fiber18.92	21.1991%	-0.0386%	
Buried Fiber	18.94	12.3508%	0.0506%
Pair Gain Equip.	8.06	1.1248%	2.4342%
Buildings	42.61	2.1861%	4.8761%
Land	99.00	99.9000%	100.0000%
Switching Equip	9.80	3.0860%	4.9665%
Circuit Equipment	8.46	3.1125%	2.4553%
Motor Vehicles	8.19	1.7836%	12.7471%
Special Purp. Veh.	10.04	0.9549%	22.6433%
Garage Work Eq.	12.10	0.5168%	3.1721%
Other Work Eq.	13.81	0.9974%	2.4784%
Furniture	16.09	0.4586%	3.0272%
Office Equip.	11.08	0.5156%	2.1693%
Gen'l Purp.Comp.	5.39	0.5156%	3.3170%

Column	Label	Formula	Explanation
A	Clli	Input	Unique eight (8) digit code provided by OnTarget data expanded to eleven (11) by matching it with LERG data.
B	Company	Input	The name of the Operating Company taken from the OCNAME column of the wire center BCM XCEL spreadsheets.
C	Company Size	Input	Companies are categorized as L = Large, M = Medium, S = Small.
D	Holding or Parent Company	Input	Holding or Parent Company of Operating Company.
E	Central Office Type	Input	H = Host Office, R = Remote Office, S = Stand Alone Office
F	Census Block Group Number	Input	The FIPS code of the Census Block Group. This is in the 12-character form ssccctttttg, where ss=state, ccc=county, tttttt=tract and g=group.From Census Bureau Tape SPF 3
G	Quadrant	Input	Calculated from Stopwatch data base where 1 = East, 2 = North, 3 = West and 4 = South.
H	Omega	Input	Calculated from Stopwatch data base.
I	Alpha	Input	Calculated from Stopwatch data base.
J	Centroid Distance Feet	Input	Calculated from Stopwatch data base. The distance, in feet with two fractional digits, from the Wire Center location to the centroid of the subject Census Block Group. This value takes into account the curvature of the earth.
K	Total House Holds	Input	Count of Households in the Census Block Group. This number is taken from the Census Bureau's 1990 figures, then modified for each CBG of a county by the Census Bureau's 1995 County by County population estimate. This is rounded to a whole number.
L	Total Business Lines	Input	Count of business lines in the CBG. This number is taken directly from the data of the BCM.

Column	Label	Formula	Explanation
M	Area-sq Miles	Input	Determined from the boundaries extracted from the Census Bureau's TIGER files. Area of the CBG in square miles with 6 fractional digits. Low density CBG's are subject to a specific reduction in stated area, based on the road network.
N	Depth to Bedrock (Inches)	Input	Average minimum depth to bedrock for the CBG, expressed in inches up to 2 fractional digits.
O	Rock Hardness	Input	Predominant rock hardness for the CBG. Hard or soft, or blank to indicate neither.
P	Surface Soil Texture	Input	Predominant surface soil texture in the CBG, an abbreviation of up to 7 characters.
Q	Water Table Depth (Feet)	Input	Average minimum water table depth for the CBG, expressed in feet with up to 2 fractional digits.
R	Minimum Soil Slope	Input	Average minimum ground slope for the CBG, expressed with 2 fractional digits.
S	Maximum Soil Slope	Input	Average maximum ground slope for the CBG, expressed with 2 fractional digits.
T	New Terrain Variable	Input	This field is empty. The last character of each of these records will be a comma, indicating that a field is logically present but actually missing at the end.
U	Density-Total HH/Sqmi	=IF(M2=0,0,(K2+L2/DensAdjUnits)/M2)	Calculates the number of House Holds and Business Units per sq. mile.
V	Total CBG Lines Served	=(K2*ResLinesMultiplier)+L2	Calculates total residence and business lines served in a CBG. Total residence lines are derived by multiplying Total House Holds (K2) by the ResLinesMultiplier (the ratio of 1995 lines from ARMIS to 1995 House Holds from NECA data). Total Business lines (L2) are added to total residence lines.

Column	Label	Formula	Explanation
W	Total "B" Distance	=IF(R2>MinSlopeTrigger,IF(S2>MaxSlopeTrigger,CombSlopeFactor,MinSlopeFactor),IF(S2>MaxSlopeTrigger,MaxSlopeFactor,1))*J2*COS((PI()/180)*I2)	Calculates terrain adjusted length of feeder cable from CO to centroid of CBG and converts air miles to route miles.
X	Segment A	=J2*SIN((PI()/180)*I2)*IF(R2>MinSlopeTrigger,IF(S2>MaxSlopeTrigger,CombSlopeFactor,MinSlopeFactor),IF(S2>MaxSlopeTrigger,MaxSlopeFactor,1))	Calculates terrain adjusted length of sub-feeder cable from CO to centroid of CBG and converts air miles to route miles.
Y	Segment D	=IF(R2>MinSlopeTrigger,IF(S2>MaxSlopeTrigger,CombSlopeFactor,MinSlopeFactor),IF(S2>MaxSlopeTrigger,MaxSlopeFactor,1))*SQRT(M2)*5280	Calculates terrain adjusted length of the side of a CBG, assuming a square CBG.
Z	Total Route Distance to CBG	=IF(X2>(0.5*Y2),W2+X2-(0.5*Y2),W2)	Calculates total length of feeder, i.e. total "B" distance plus segment A, to the edge of the CBG.
AA	"A" Sub Feeder Distance	=Z2-W2	Calculates the subfeeder length between the end of the main feeder segment to the edge of the CBG.
AB	Number of lots in CBG	=~~J2~~K2*(VLOOKUP(U2 ~~T2~~ DensityHhTable,2)+(1-VLOOKUP(~~T2~~ U2,DensityHhTable,2))/VLOOKUP(~~T2~~ U2,DensityHhTable,3))	The number of lots in a CBG are based on the proportion of single family residences and HH per multi-family residence for a given density zone, i.e. Number of lots in CBG=Total House Holds * (% single family + (1-% single family/HH per multi-family)).
AC	Number of Lots per Base Side	=IF(SQRT(AB2)<2,2,CEILING(SQRT(AB2),1))	Determines the number of lots per CBG side with a minimum of two.
AD	Base Lot Side Length	=Y2/AC2	Calculates the length of one side of a lot.
AE	Maximum Loop Distance within the CBG	=(1.5*Y2)-(2*AD2)	Calculates maximum loop distance adjusted to prevent placement from boundary to boundary within the CBG.
AF	Surface Indicator	=IF(ISBLANK(P2),0,IF(ISERROR(VLOOKUP(P2,SurfaceTextureTable,2))=TRUE,0,VLOOKUP(P2,SurfaceTextureTable,2)))	Determines whether the terrain condition for surface texture effects the placement cost of the facility.
AG	Copper Depth Condition	=IF(AND($N2<=NormalUGDepth,$O2="HARD"),1,IF(AND($N2>NormalUGDepth,$AF2=0),3,2))	This formula determines whether additional placement costs will be caused due to bedrock being within the normal placement depth of

Column	Label	Formula	Explanation
			copper facilities and if the bedrock is described as hard. If the depth to bedrock in column N ~~M~~ is less than or equal to the normal placement depth of copper facilities, in cell C4 of the Misc. Inputs tab, and the value of rock hardness in Column O ~~N~~ equals "Hard", then the placement difficulty condition equals 1. If the depth to bedrock in column N ~~M~~ is greater than the normal placement depth of copper facilities, then the placement difficulty condition equals 3. Otherwise, the placement difficulty condition equals 2.
AH	Fiber Depth Condition	=IF(AND($N2<=NormalFiberDepth,$O2="HARD"),1,IF (AND($N2>NormalFiberDepth,$AF2=0),3,2))	This formula determines whether additional placement costs will be caused due to bedrock being within the normal placement depth of fiber facilities and if the bedrock is described as hard. If the depth to bedrock in column N ~~M~~ is less than or equal to the normal placement depth of fiber facilities, in cell C5 of the Misc. Inputs tab, and the value of rock hardness in Column O ~~N~~ equals "Hard", then the placement difficulty condition equals 1. If the depth to bedrock in column N ~~M~~ is greater than the normal placement depth of fiber facilities, then the placement difficulty condition equals 3. Otherwise, the placement difficulty condition equals 2.
AI	New Terrain and Water Cost Multiplier	=IF(T2>NewTerrainTrigger,NewTerrainFactor,1)*IF(Q2 <CriticalWaterDepth,1+(WaterFactor/100),1)	Multiplier currently equals 1. Logic included in order to accommodate future variable that identifies extraordinary terrain conditions.
AJ	Main Feeder Segment Total Distance	=IF(AND(A2=A1,G2=G1),W2-W1,W2)	This formula calculates the feeder cable segment length immediately adjacent to the CBG.
AK	Block Group Sequence Number	=IF(OR(NOT(G2=G1),NOT(A2=A1)),1,AK1+1)	This formula provides a sequence number for each CBG in a Quadrant. If the CLLI code or the Quadrant are not the same as the prior CBG, the result is 1. If they are the same, it adds 1 to the sequence number of the prior CBG.
AL	Number of Feeder legs in CBG	=IF(Y2-(2*AD2)<=0,1,CEILING((Y2-(2*AD2))/(2*CprMaxDistr),1))	This formula calculates the number of feeder legs required by dividing the length of a CBG side (less two lots) by the maximum copper distribution length, rounding any fractions up to the nearest whole number.
AM	Number of Lines per Feeder Leg	=V2/AL2	The Number of Lines per Feeder Leg is calculated by dividing Total CBG Lines Served by the Number of Feeder Legs in CBG.

Column	Label	Formula	Explanation
AN	CLLIQUAD	=A2&G2	This cell is a combines of the CLLI code and Quadrant number text entries into a single text word.
AO	Distribution Vertical Distance per Feeder	=IF(((Y2/AL2)-(2*AD2))<1,Y2/AL2,(Y2/AL2)-(2*AD2))	This formula calculates the vertical distance of the distribution cable in a CBG adjusting for those cases where a CBG or feeder has one or two lots on a side. This adjustment prevents the anomalous result of negative vertical distribution lengths.
AP	Potential Max Horizontal Copper Distribution Distance	=IF(CprMaxDistr-(AO2/2)>0,CprMaxDistr-(AO2/2),0)	This formula calculates the Potential Max Horizontal Copper Distribution Distance by determining whether the maximum length of copper cable in a CBG distribution area (default value = 12,000 feet) minus half of the distribution vertical distance per feeder is greater than zero. If greater than zero then the Potential Max Horizontal Copper Distribution Distance is the maximum length of copper cable in a CBG distribution area minus half of the distribution vertical distance.
AQ	Number of Lots Between Terminals	=IF(AP2>((Y2-AD2)/2),AC2,(INT(AP2/AD2)+1)*2)	The Number of Lots Between Terminals equals the Number of Lots per Base Side if the Potential Max Horizontal Copper Distribution Distance is greater than one half of a CBG side minus one lot. If the previous condition is not met then the Number of Lots Between Terminals equals twice the integer value of the Potential Max Horizontal Copper Distribution Distance per Base Lot Side Length plus one.
AR	Number of Distribution Legs	=IF(AC2<2,1,EVEN(AC2)/2)	The Number of Distribution Legs is one half of the Number of Lots per Base Side rounded up to an even number if the Number of Lots per Base Side is greater than 2. If there are fewer than 2 Lots per base side then the Number of Distribution Legs equals 1.
AS	Number of Distribution Vertical Legs per Terminal	=IF(AQ2>=AC2,AR2,AQ2/2)	The Number of Vertical Legs per Terminal equals the number of Distribution Legs if the Number of Lots Between Terminals is greater than or equal to the Number of Lots per Base Side, otherwise it equals one half of the Number of Lots Between Terminals.
AT	Number of Terminal Locations per Feeder Leg	=CEILING(AR2/AS2,1)	The Number of Terminal Locations per Feeder Leg equals the Number of Distribution Legs divided by the Number of Distribution Vertical Legs per Terminal rounded up to the next integer.

Column	Label	Formula	Explanation
AU	Special Access Lines in CBG	=L2*SpecAccRatio	This formula calculates the number of special access lines per CBG based on the special access ratio in cell C37 of the Misc. Inputs Tab.
AV	Lines in CBG Provisioned as DS-1s	=AU2*VLOOKUP(V2,VoiceGradeRatioTable,5)+CF2* VLOOKUP(V2,VoiceGradeRatioTable,3)	The number of DS-1's per CBG is calculated by applying the % of special access lines served by DS1's and the % switched lines on DS1 from the Voice Grade Ratio Table in the Percent Table Inputs tab to the number of special access lines per CBG and switched access lines per CBG in columns AS and CD, respectively.
AW	Segment Type 1	=IF(AND((W2+AA2+AE2)<Breakpoint,((V2-AV2+AV2/12)/VLOOKUP(U2,DensityFillTable,2))<MaxDistrSize),"Cable",IF(AND((W2+AA2+AE2)>=Breakpoint,(AM2/AT2)/ElectronicFill<=240),"DLC-S","DLC-L"))	This formula determines the type of facility technology needed for the CBG. This is determined by calculating the total loop length (i.e. the sum of the "B" distance (col. ~~V~~ W), "A" feeder distance (col. ~~Z~~ AA) and the max. loop distance (col. ~~AC~~ AE)) and comparing it with the Breakpoint (Fixed Tables tab, Misc. Calc. table). If total loop length is less than the Breakpoint and the cable size is less than the max. distrib. cable size (see,Misc. Inputs tab, Cable & Wire Inputs table, cell C8) then copper "Cable" is placed. If the total loop length exceeds the Breakpoint the facility is fiber on a DLC-S if there are fewer than 240 lines per terminal location and fiber on DLC-L if there are more than 240 lines per terminal.
AX	Segment Type 2	=IF(OR(AK3=1,ISBLANK(AW3),AND(AN2=AN3,AW2=AW3,ISBLANK(AX3))),"",IF(NOT(AW2=AW3),AW3,AX3))	This formula determines if a second facility type must be provided in the feeder segment. If any block group further from the wire center requires different facilities than the current block group, it shows the second required facility.
AY	Segment Type 3	=IF(OR(AK3=1,ISBLANK(AW3),AND(AN2=AN3,AX2=AX3,ISBLANK(AY3))),"",IF(NOT(AX2=AX3),AX3,AY3))	This formula determines if a second facility type must be provided in the feeder segment. If any block group further from the wire center requires different facilities than the current block group, it shows the second required facility.
AZ	Total Lines on Copper	=IF(AW2="Cable",IF(OR(AK3=1,AND(NOT(AK3=1),NOT(AW2=AW3),NOT(AX2="Cable"),NOT(AY2="Cable"),NOT(AX3="Cable"),NOT(AY3="Cable")),ISBLANK(AZ3)),V2-AV2+AV2/12,(V2-AV2+AV2/12)+AZ3),IF(OR(AX2="Cable",AY2="Cable",AND(AN2=AN3,AZ3>0)),AZ3,0))	This formula accumulates the total number of lines served on copper in a CBG.

Column	Label	Formula	Explanation
BA	Total Lines on a large DLC (DLC-L)	=IF(AW2="DLC-L",IF(OR(AK3=1,AND(NOT(AK3=1),NOT(AW2=AW3),NOT(AX2="DLC-L"),NOT(AY2="DLC-L"),NOT(AX3="DLC-L"),NOT(AY3="DLC-L")),ISBLANK(BA3)),V2,V2+BA3),IF(OR(AX2="DLC-L",AY2="DLC-L",AND(AN2=AN3,BA3>0)),BA3,0))	This formula accumulates the total number of lines served on large DLC (DLC-L) in a CBG.
BB	Total Lines on small DLC (DLC-S)	=IF($AW2="DLC-S",IF(OR($AK3=1,AND(NOT($AK3=1),NOT($AW2=$AW3),NOT(AX2="DLC-S"),NOT(AY2="DLC-S"),NOT(AX3="DLC-S"),NOT(AY3="DLC-S")),ISBLANK(BB3)),$V2,$V2+BB3),IF(OR($AX2="DLC-S",$AY2="DLC-S",AND(AN2=AN3,BB3>0)),BB3,0))	This formula accumulates the total number of lines served on small DLC (DLC-S) in a CBG.
BC	Copper Main Feeder (B Segment) Pairs Needed	=AZ2/VLOOKUP(U2,DensityFillTable,2)	This formula calculates the total copper main feeder pairs needed by dividing the total lines on copper by the appropriate feeder fill (Percent Table Inputs tab, Density Fill Table, column 2 (Feeder)).
BD	Number of Max Size Main Feeder Copper Cables	=TRUNC(IF(BC2>MaxFeederSize,BC2/MaxFeederSize,0))	This formula calculates the number of main feeder copper cables required by dividing the number copper main feeder pairs needed by the maximum feeder cable size (Misc. Inputs tab, Copper & Wire Inputs table, cell C7). If the number feeder pairs is less than the maximum size feeder cable the formula reports 0. Non-zero values are truncated.
BE	Residual Copper Main Feeder Size	=IF(NOT(BC2=0),INDEX(FeederCableSize,MATCH(BC2-(MaxFeederSize*BD2),FeederCableSize,-1),1),0)	This formula calculates the size of the residual copper feeder cable required in the feeder segment. It reports the next largest cable size above the actual pairs required after all pairs assigned to maximum cable sizes are subtracted.
BF	Copper Cable Structure %	=IF(AND(NOT(AW2="Cable"),NOT(AX2="Cable"),NOT(AY2="Cable")),0,IF(BD2>0,Over4200,IF(OR(AW2="DLC-S",AX2="DLC-S",AY2="DLC-S",AW2="DLC-L",AX2="DLC-L",AY2="DLC-L"),VLOOKUP(BE2,StructureAllocationTable,2),1)))	This formula determines the percent of structure assigned to copper facilities. See Percent Table Inputs, Structure Allocation Table, Cable Structure %.
BG	Fiber Structure %	=1-BF2	Fiber structure percent is defined as 1 - Copper Cable structure percent.

Column	Label	Formula	Explanation
BH	Subfeeder (A Segment) Copper Feeder Pairs Needed	=IF(AW2="Cable",(V2-AV2+AV2/12)/VLOOKUP(U2,DensityFillTable,2),0)	This formula determines subfeeder segment type 1 feeder pairs required (adjusted for lines provisioned on DS1) by dividing segment type 1 pairs by the appropriate fill factor.
BI	Number of Max Size Subfeeder Copper Cables	=TRUNC(IF(BH2>MaxFeederSize,BH2/MaxFeederSize,0))	This formula calculates the number of maximumsize subfeeder cooper cables required in the CBG.
BJ	Subfeeder Copper Cable Size	=IF(BH2=0,0,INDEX(FeederCableSize,MATCH(BH2-(MaxFeederSize*BI2),FeederCableSize,-1),1))	This formula calculates the size of the subfeeder copper cable required. It uses the Feeder Cable Size table to search and report back. It reports the next largest feeder cable size above the number of actual pairs required after all pairs are assigned to maximum cable sizes are subtracted.
BK	Number of Main Feeder segments in quadrant	=IF(A2=0,0,IF(AND(A2=A3,G2=G3),BK3+1,1))	This formula counts the number of feeder segments in a quadrant.
BL	Longest Actual Horizontal Copper Distribution Distance	=IF(AQ2=AC2,ROUNDUP((AC2-1)/2,1)*AD2,((AQ2/2)-1)*AD2)	This formula calculates the longest horizontal copper distribution distance in a CBG.
BM	Horizontal Fiber Feeder Cable Length	=Y2-AD2-BL2	This formula determines the length of the horizontal fiber feeder cable by subtracting from the side of a CBG the base lot size and the longest actual horizontal copper distribution distance.
BN	Total Horizontal Copper Cable Length	=BL2*2*AT2*AL2	This formula determines the total horizontal copper cable length based on the longest actual horizontal copper distribution distance, the number of terminal locations per feeder leg and the number of feeder legs in CBG.
BO	# Voice Grade Lines Equipped per Terminal Location	=IF(AW2="DLC-S",CEILING((AM2/AT2)/ElectronicFill,6),IF(AW2="DLC-L",CEILING((((CF2*VLOOKUP(V2,VoiceGradeRatioTable,2)+AU2*VLOOKUP(V2,VoiceGradeRatioTable,4))/AL2)/AT2)/ElectronicFill,4),0))	This formula calculates the number voice grade lines per terminal location adjusted for electronic fill.
BP	# DLC-L Systems at Full Capacity	=TRUNC(BO2/2016)	This formula calculates the number of large DLC (DLC-L) systems functioning at a capacity of 2016 voice grade circuits per system.

Column	Label	Formula	Explanation
			This calculated by dividing the number of voice grade lines equipped per terminal location by 2016.
BQ	# Switched Lines in Overflow DLC-L Terminal	=BO2-(2016*BP2)	This formula determines the number switched lines above the capacity of the DLC-L's.
BR	# Lines at DS-1 per Terminal Location	=IF(AW2="DLC-L",((AV2/AL2)/AT2)/HiCapFill,0)	This formula calculates the number of segment type 1 lines at the DS-1 rate per terminal location adjusted for fill.
BS	# DS-3/DS-1 Units per Terminal Location	=CEILING(BR2/2016,1)	Calculates the number of DS-1's per terminal location.
BT	Total # Terminal Locations in CBG	=AT2*AL2	Calculates the total number of terminal locations in a CBG by multiplying the number of terminal locations per feeder leg by the number of feeder legs in a CBG.
BU	# Fibers Required per Terminal Location	=IF(AW2="Cable",0,IF(AW2="DLC-S",4,(BP2+1+BS2)*4))	Determines the number of fibers per terminal location where the number of fibers per small DLC (DLC-S) is 4 and 4 per each large DLC (DLC-L) system.
BV	Total Number Fibers per Feeder Leg	=IF(BO2=0,0,IF(AW2="Cable",0,IF(AW2="DLC-L",CEILING(AT2*(BP2+1)*4*IF(BO2<2016,BO2/2016,1)+BS2*4*AT2,4),CEILING((AT2*BU2)/TRUNC(672/BO2),4))))	Calculates the number of fibers per feeder leg where appropriate.
BW	Total # Fibers For CBG	=BV2*AL2	Calculates the total number of fibers in a CBG by multiplying the total number of fibers per feeder leg by the number of feeder legs in a CBG.
BX	# DLC-S Fibers this CBG	=IF(AW2="DLC-S",BW2,0)	Determines the number of fibers in the main feeder route serving small DLC systems in a Block Group ("BG"), i.e. a census block group.
BY	Total # DLC-S Fibers in Main Feeder Segment	=IF(BB2=0,0,IF(AK3=1,BX2,IF(BB2=BB3,BY3,IF(AND(BB2<672*ElectronicFill,BX2=4),(CEILING(BB2/(672*ElectronicFill),1))*4,BX2+BY3))))	Determines the total number of fibers in the main feeder segment serving small DLC systems adjusted for electronic fill.

Column	Label	Formula	Explanation
BZ	# DLC-L Fibers this CBG	=IF(AW2="DLC-L",BW2,0)	Determines whether a block group/census block group is served by large DLC (DLC-L) systems. If the CBG is served by DLC-L it counts the total number of fibers for the CBG.
CA	Total # DLC-L Main Feeder Segment Fibers	=IF(BA2=0,0,IF(AK3=1,BZ2,IF(BA2=BA3,CA3,CA3+BZ2)))	Determines whether any lines are served by DLC-L systems. If a CBG is served by DLC-L and is CBG the closest to the CO the Total number of DLC-L main feeder segment fibers equals the number DLC-L fibers in the CBG. For all other CBG's
CB	Number of Main Feeder Segment Fibers Required	=CA2+BY2	This formula adds total number of DLC-S fibers in the main feeder segment and the total number of DLC-L fibers in the main feeder segment to determine the number of main feeder segment fibers required in the CBG.
CC	Number of Main Feeder Maximum Size Fiber Cables	=TRUNC(IF(CB2>MaxFiberSize,CB2/MaxFiberSize,0))	If the number of fibers required in the main feeder segment is greater than the maximum fiber cable size this formula truncates the number. If it is less than the maximum fiber cable size the formula reports a zero.
CD	Last Main Feeder Fiber Cable Size	=IF(CB2=0,0,INDEX(FiberCableSize,MATCH(CB2-(MaxFiberSize*CC2),FiberCableSize,-1),1))	This formula determines the size of the main feeder fiber cable based on the number of main feeder segment fibers required. It selects next largest fiber cable size that matches the number of residual main feeder segment fibers.
CE	Subfeeder Fiber Size	=IF(OR(AA2=0,AW2="Cable"),"N/A",INDEX(FiberCableSize,MATCH(BW2,FiberCableSize,-1),1))	This formula determines whether there is fiber subfeeder in the CBG. If there is fiber subfeeder it selects the next largest cable size for the total number of fibers for the CBG (BU3).
CF	Switched Lines in CBG	=V2-AU2	Total switched lines equals the total CBG lines served minus the special access lines in the CBG.
CG	Switched Lines Equipped	=CF2/SwitchFillFactor	This formula calculates the number lines for which equipment must be sized by dividing the switched lines in the CBG by the switch fill factor.
CH	Is Main Feeder Segment copper only?	=IF(CD2>0,"NO","YES")	If Last Main Feeder Fiber Cable Size is greater than 0, then Main feeder segment is not copper only and the formula returns a "No" to the cell, otherwise the formula returns a "Yes" to the cell.

Column	Label	Formula	Explanation
CI	Main Feeder Segment B Underground Distance	=IF(CH2="YES",VLOOKUP(U2,CopperPlantMixTable,2),VLOOKUP(U2,FiberPlantMixTable,2))*AJ2	This formula calculates the length of the underground portion for copper, if the main feeder segment is copper only and fiber cable if the feeder segment is not copper only. The Main Feeder Segment Total Distance is multiplied by proportion of copper or fiber that is underground.
CJ	Main Feeder Segment B Installed Underground Copper $	=IF(BE2=0,0,CI2*(VLOOKUP(BE2,FeederCableCost,2,FALSE)+(BD2*VLOOKUP(MaxFeederSize,FeederCableCost,2,FALSE))))*CopperCostRatio	This formula calculates the cost of the B segment underground copper cable.
CK	Main Feeder Segment B Buried Distance	=IF(CH2="YES",VLOOKUP(U2,CopperPlantMixTable,3),VLOOKUP(U2,FiberPlantMixTable,3))*AJ2	This formula calculates the length of the buried portion for copper, if the main feeder segment is copper only and fiber cable if the feeder segment is not copper only. The Main Feeder Segment Total Distance is multiplied by proportion of copper or fiber that is buried.
CL	Main Feeder Segment B Installed Buried Copper $	=IF(BE2=0,0,CK2*(VLOOKUP(BE2,FeederCableCost,3,FALSE)+(BD2*VLOOKUP(MaxFeederSize,FeederCableCost,3,FALSE))))*CopperCostRatio	This formula calculates the cost of the B segment buried copper cable.
CM	Main Feeder Segment B Aerial Distance	=IF(CH2="YES",VLOOKUP(U2,CopperPlantMixTable,4),VLOOKUP(U2,FiberPlantMixTable,4))*AJ2	This formula calculates the length of the aerial portion for copper, if the main feeder segment is copper only and fiber cable if the feeder segment is not copper only. The Main Feeder Segment Total Distance is multiplied by proportion of copper or fiber that is aerial.
CN	Main Feeder Segment B Installed Aerial Copper $	=IF(BE2=0,0,CM2*(VLOOKUP(BE2,FeederCableCost,4,FALSE)+(BD2*VLOOKUP(MaxFeederSize,FeederCableCost,4,FALSE))))*CopperCostRatio	This formula calculates the cost of the B segment aerial copper cable.
CO	Total Main Feeder Segment B Copper $	=CJ2+CL2+CN2	Calculates total segment B copper cost.
CP	Number of Ducts in Segment B run	=IF(CI2<1,0,IF(BE2>0,1,0)+BD2+IF(CD2>0,1,0)+IF(J2="",0,1)	Determines the number of segment B ducts required by adding the Residual Copper Main Feeder Size, the Number of Max Size Main Feeder Copper Cables, Last Main Feeder Fiber Cable Size plus one for spare.

Column	Label	Formula	Explanation
CQ	Cost per manhole for segment B	=IF(CP2<=9,VLOOKUP(CP2,ConduitManholeTable,VLOOKUP(AH2,SurfaceConditionTable,2)),VLOOKUP(5,ConduitManholeTable,VLOOKUP(AH2,SurfaceConditionTable,2))+TRUNC(CP2/9)*VLOOKUP(99,ConduitManholeTable,VLOOKUP(AH2,SurfaceConditionTable,2)))	This formula calculates the cost of per segment B manhole based on the number of ducts in segment B, the surface condition and the fiber depth condition.
CR	Number of manholes in segment B run	=IF(CI2<1,0,ROUND(CI2/VLOOKUP(U2,SpacingTable,2),1)+IF(J2="",0,IF(AK2=1,1,0))	Determines the number of manholes required in a segment B run where the Main Feeder Segment B Underground Distance is divided by the density specific manhole spacing plus 1 for the CBG closest to the CO.
CS	Number of poles in segment B run	=IF(CM2<1,0,ROUND(CM2/VLOOKUP(U2,SpacingTable,3),1)+IF(J2="",0,IF(VLOOKUP(U2,CopperPlantMixTable,4)<0.005,0,1)))	Determines the number of poles required in a segment B run where the Main Feeder Segment B Aerial Distance is divided by the density specific pole spacing plus 1 to prevent having a CBG with one pole.
CT	Main Feeder Underground Segment B Total Structure $	=AI2*(CQ2*CR2+CI2*(CP2*Conduitperductfoot+IF(AH2=1,VLOOKUP(U2,HardRockStructure,2),IF(OR(AH2=2,AF2=1),VLOOKUP(U2,SoftRockStructure,2),VLOOKUP(U2,NormalStructure,2)))))	This formula calculates the Main Feeder Underground Segment B Total Structure $ by multiplying the sum of manhole and conduit costs (adjusted hardrock, softrock or normal terrain conditions) by New Terrain and Water Cost Multiplier.
CU	Main Feeder Buried Segment B Total Structure $	=AI2*CK2*IF(CH2="YES",IF(AG2=1,VLOOKUP(U2,HardRockStructure,4),IF(OR(AG2=2,AF2=1),VLOOKUP(U2,SoftRockStructure,4),VLOOKUP(U2,NormalStructure,4))),IF(AH2=1,VLOOKUP(U2,HardRockStructure,4),IF(OR(AH2=2,AF2=1),VLOOKUP(U2,SoftRockStructure,4),VLOOKUP(U2,NormalStructure,4))))	This formula calculates the Main Feeder Buried Segment B Total Structure $ by multiplying the density specific terrain adjusted costs per foot by New Terrain and Water Cost Multiplier and the Main Feeder Segment B Buried Distance.
CV	Main Feeder Aerial Segment B Total Structure $	=AI2*CS2*(IF(AH2=1,VLOOKUP(U2,HardRockStructure,6),IF(OR(AH2=2,AF2=1),VLOOKUP(U2,SoftRockStructure,6),VLOOKUP(U2,NormalStructure,6))))	This formula calculates the Main Feeder Aerial Segment B Total Structure $ by multiplying the terrain adjusted aerial unit costs by New Terrain and Water Cost Multiplier and the Number of Poles in segment B run.
CW	Total Main Feeder Segment B Structure $	=SUM(CT2:CV2)	This formula determines the Total Main Feeder Segment B Structure $ by adding the structure cost of the underground, buried and aerial portions of the segment B run.

Column	Label	Formula	Explanation
CX	Copper Main Feeder Cost per Line	=IF(AZ2=0,0,(CO2+CW2*BF2)/AZ2)	This formula determines the Copper Main Feeder Cost per line by dividing the sum of Total Main Feeder Segment B Copper $ and Total Main Feeder Segment B Structure $ * Copper Cable Structure % by the Total Lines on Copper.
CY	Cumulative Main Feeder Copper Cost per Line	=SUM(INDIRECT("cx"&ROW(CX2)&":cx"&MATCH($AN2,ClliQuad,0)+1))	This formula sums the Copper Main Feeder Cost per line for matching CLLIQuads.
CZ	Main Feeder Copper $ Allocated this CBG	=IF(AW2="Cable",V2*CY2,0)	Main Feeder Copper $ Allocated this CBG is determined by multiplying the total lines served in the CBG by the cumulative main Feeder Copper Cost per line if segment type 1 is cable. If segment type 1 is not cable the formula returns a value of zero.
DA	Subfeeder Cable Segment A Underground Distance	=IF(OR(AA2=0,BH2=0),0,VLOOKUP(U2,CopperPlant MixTable,2)*AA2)	This formula calculates the Subfeeder Cable Segment A underground Distance as long as neither the "A" Sub Feeder Distance or Subfeeder (A Segment) copper feeder pairs needed are not zero. The Subfeeder Cable Segment A underground Distance equals the "A" Sub Feeder Distance multiplied by the density specific percent underground factor.
DB	Subfeeder Underground Cable Segment A Copper $	=IF(OR(AA2=0,BJ2=0),0,DA2*(VLOOKUP(BJ2,Feeder CableCost,2,FALSE)))*CopperCostRatio	If either the distance "A" or "A" feeder cable size are not zero, multiply the "A" distance by the price per foot times 1-the % discount (the default discount is zero).
DC	Subfeeder Cable Segment A Buried Distance	=IF(OR(AA2=0,BH2=0),0,VLOOKUP(U2,CopperPlant MixTable,3)*AA2)	This formula calculates the Subfeeder Cable Segment A Buried Distance as long as neither the "A" Sub Feeder Distance or Subfeeder (A Segment) copper feeder pairs needed are not zero.
			The Subfeeder Cable Segment A buried Distance equals the "A" Sub Feeder Distance multiplied by the density specific percent buried factor.
DD	Subfeeder Buried Cable Segment A Copper $	=IF(OR(AA2=0,BJ2=0),0,DC2*(VLOOKUP(BJ2,Feeder CableCost,3,FALSE)))*CopperCostRatio	If either the distance "A" or "A" feeder cable size are not zero, multiply the "A" distance by the price per foot times 1-the % discount (the default discount is zero).
DE	Subfeeder Cable Segment A Aerial Distance	=IF(OR(AA2=0,BH2=0),0,VLOOKUP(U2,CopperPlant MixTable,4)*AA2)	This formula calculates the Subfeeder Cable Segment A Aerial Distance as long as neither the "A" Sub Feeder Distance or Subfeeder (A Segment) copper feeder pairs needed are not zero. The Subfeeder Cable Segment A aerial Distance equals the "A" Sub

Column	Label	Formula	Explanation
			Feeder Distance multiplied by the density specific percent aerial factor.
DF	Subfeeder Aerial Cable Segment A Copper $	=IF(OR(AA2=0,BJ2=0),0,DE2*(VLOOKUP(BJ2,FeederCableCost,4,FALSE)))*CopperCostRatio	If either the distance "A" or "A" feeder cable size are not zero, multiply the "A" distance by the price per foot times 1-the % discount (the default discount is zero).
DG	Total Subfeeder Segment A Copper Cable $	=DB2+DD2+DF2	This formula calculates the total segment A copper cost.
DH	Number of Ducts in Segment A run	=IF(DA2<1,0,2+BI2)	If the distance "A" is not zero the number of ducts in a run equals 2 times the number of Max Size Subfeeder Copper cables.
DI	Cost per manhole for segment A	=IF(DH2=0,0,IF(DH2<=9,VLOOKUP(DH2,ConduitManholeTable,VLOOKUP(AH2,SurfaceConditionTable,2)),VLOOKUP(5,ConduitManholeTable,VLOOKUP(AH2,SurfaceConditionTable,2))+TRUNC(DH2/9)*VLOOKUP(99,ConduitManholeTable,VLOOKUP(AH2,SurfaceConditionTable,2))))	This formula calculates the cost of per segment A manhole based on the number of ducts in segment A, the surface condition and the fiber depth condition.
DJ	Number of manholes in segment A run	=IF(DA2=0,0,ROUND(DA2/VLOOKUP(U2,SpacingTable,2),1)+IF(AK2=1,1,0))	Determines the number of manholes required in a segment A run where the Subfeeder Segment A Underground Distance is divided by the density specific manhole spacing plus 1 for the CBG closest to the CO.
DK	Number of poles in segment A run	=IF(DE2=0,0,ROUND(DE2/VLOOKUP(U2,SpacingTable,3),1)+IF(VLOOKUP(U2,CopperPlantMix Table,4)<0.005,0,1))	Determines the number of poles required in a segment A run where the Subfeeder Segment A Aerial Distance is divided by the density specific pole spacing plus 1 to prevent having a CBG with one pole.
DL	Total Subfeeder Segment A Underground Structure $	=IF(DH2=0,0,AI2*(DI2*DJ2+DA2*(DH2*Conduitperductfoot+IF(AH2=1,VLOOKUP(U2,HardRockStructure,2),IF(OR(AH2=2,AF2=1),VLOOKUP(U2,SoftRockStructure,2),VLOOKUP(U2,NormalStructure,2))))))	This formula calculates the Subfeeder Underground Segment A Total Structure $ by multiplying the sum of manhole and conduit costs (adjusted for hardrock, softrock or normal terrain conditions) by New Terrain and Water Cost Multiplier.

Column	Label	Formula	Explanation
DM	Total Subfeeder Segment A Buried Structure $	=IF(AA2=0,0,AI2*DC2*IF(AW2="Cable",IF(AG2=1,VLOOKUP(U2,HardRockStructure,4),IF(OR(AG2=2,AF2=1),VLOOKUP(U2,SoftRockStructure,4),VLOOKUP(U2,NormalStructure,4))),IF(AH2=1,VLOOKUP(U2,HardRockStructure,4), IF(OR(AH2=2,AF2=1),VLOOKUP(U2,SoftRockStructure,4),VLOOKUP(U2,NormalStructure,4)))))	This formula calculates the Subfeeder Buried Segment A Total Structure $ by multiplying the density specific terrain adjusted costs per foot by New Terrain and Water Cost Multiplier and the Subfeeder Segment A Buried Distance.
DN	Total Subfeeder Segment A Aerial Structure $	=IF(DK2=0,0,AI2*DK2*(IF(AH2=1,VLOOKUP(U2,HardRockStructure,6),IF(OR(AH2=2,AF2=1),VLOOKUP(U2,SoftRockStructure,6),VLOOKUP(U2,NormalStructure,6)))))	This formula calculates the Total Subfeeder Aerial Segment A Structure $ by multiplying the terrain adjusted aerial unit costs by New Terrain and Water Cost Multiplier and the Number of Poles in segment A run.
DO	Total Subfeeder Segment A Structure $	=SUM(DL2:DN2)	This formula determines the Total Subfeeder Segment A Structure $ by adding the structure cost of the underground, buried and aerial portions of the segment A run.
DP	Total Subfeeder Segment A Copper Structure $	=IF(AW2="Cable",DO2,0)	If Segment Type 1 is Cable the Total Subfeeder Segment A Copper Structure $ equals Total Subfeeder Segment A Structure $, otherwise it is zero.
DQ	Total Copper & T1 Related Feeder Cost Assigned this CBG	=CZ2+DG2+DP2+IF(AW2="Cable",CEILING(AV2/24,1)*CopperT1,0)	The Total Copper & T1 Related Feeder Cost Assigned this CBG equals the sum of Main Feeder Copper $ Allocated this CBG, Total Subfeeder Segment A Copper Cable $, Total Subfeeder Segment A Copper Structure $, and if Segment Type 1 equals Cable the number of DS-1s * the cost per DS-1 on Copper. If Segment Type 1 is not Cable then it adds zero.
DR	Underground Fiber Main Feeder distance	=IF(CH2="YES",0,CI2)	If the Main Feeder segment is copper only then this is zero, otherwise it equals the Main Feeder Segment B Underground Distance.
DS	Underground Fiber Main Feeder Material $	=IF(DR2=0,0,DR2*(VLOOKUP(CD2,FiberCableCost,2,FALSE)+(CC2*VLOOKUP(MaxFiberSize,FiberCableCost,2))))*FiberCostRatio	If Underground Fiber Main Feeder Distance is zero then this equals zero. If it is not zero the Underground Fiber Main Feeder Material $ is calculated by multiplying the Underground Fiber Main Feeder Distance by the cost for the appropriate Fiber cable size plus the cost associated with the Number of Main Feeder Maximum Size Fiber Cables. The total is then multiplied by Fiber Cost Ratio or Discount (default value = 0).

Column	Label	Formula	Explanation
DT	Buried Fiber Main Feeder Distance	=IF(CH2="YES",0,CK2)	The Buried Fiber Main Feeder Distance equals the Main Feeder Segment B Buried Distance unless the Main Feeder Segment is copper only which results in the Buried Fiber Main Feeder Distance being zero.
DU	Buried Fiber Main Feeder Material $	=IF(DT2=0,0,DT2*(VLOOKUP(CD2,FiberCableCost,3,FALSE)+(CC2*VLOOKUP(MaxFiberSize,FiberCableCost,3))))*FiberCostRatio	If Buried Fiber Main Feeder Distance is zero then this equals zero. If it is not zero the Buried Fiber Main Feeder Material $ is calculated by multiplying the Buried Fiber Main Feeder Distance by the cost for the appropriate Fiber cable size plus the cost associated with the Number of Main Feeder Maximum Size Fiber Cables. The total is then multiplied by Fiber Cost Ratio or Discount (default value = 0).
DV	Aerial Fiber Main Feeder Distance	=IF(CH2="YES",0,CM2)	The Aerial Fiber Main Feeder Distance equals the Main Feeder Segment B Aerial Distance unless the Main Feeder Segment is copper only which results in the Aerial Fiber Main Feeder Distance equaling zero.
DW	Aerial Fiber Main Feeder Material $	=IF(DV2=0,0,DV2*(VLOOKUP(CD2,FiberCableCost,4,FALSE)+(CC2*VLOOKUP(MaxFiberSize,FiberCableCost,4))))*FiberCostRatio	If Aerial Fiber Main Feeder Distance is zero then this equals zero. If it is not zero the Aerial Fiber Main Feeder Material $ is calculated by multiplying the Aerial Fiber Main Feeder Distance by the cost for the appropriate Fiber cable size plus the cost associated with the Number of Main Feeder Maximum Size Fiber Cables. The total is then multiplied by Fiber Cost Ratio or Discount (default value = 0).
DX	Total Fiber Main Feeder Material $	=DS2+DU2+DW2	Total Fiber Main Feeder Material $ equals the sum of Underground Fiber Main Feeder Material $, Buried Fiber Main Feeder Material $ and Aerial Fiber Main Feeder Material $.
DY	Underground Fiber Main Feeder Structure $	=IF(CH2="YES",0,CT2*BG2)	If the Main Feeder segment is Copper only Underground Fiber Main Feeder Structure $ equals zero. If not copper only then the Underground Fiber Main Feeder Structure $ equals the Main Feeder Underground Segment B Total Structure $ multiplied by the Fiber Structure %.
DZ	Buried Fiber Main Feeder Structure $	=IF(CH2="YES",0,CU2*BG2)	If the Main Feeder segment is Copper only Buried Fiber Main Feeder Structure $ equals zero. If not copper only then the Buried Fiber Main Feeder Structure $ equals the Main Feeder Buried