

Cost Estimating Manual For Wsdot Projects

Project cost estimating manual 2004

North American Tunneling 2018

Proceedings Alan Howard 2018-06-24 Your timely source for more cost-effective and less disruptive solutions to your underground infrastructure needs. The North American Tunneling Conference is the premier biennial tunneling event for North America, bringing together the brightest, most resourceful, and innovative minds in the tunneling industry. It underscores the important role that the industry plays in the development of underground spaces, transportation and conveyance systems, and other forms of sustainable underground infrastructure. With every conference, the number of attendees and breadth of topics grow. The authors—experts and leaders in the

industry—share the latest case histories, expertise, lessons learned, and real-world applications from around the globe. Crafted from a collection of 126 papers presented at the conference, this book takes you deep inside the projects. It includes challenging design issues, fresh approaches on performance, future projects, and industry trends as well as ground movement and support, structure analysis, risk and cost management, rock tunnels, caverns and shafts, TBM technology, and water and wastewater conveyance.

Government Reports Announcements & Index 1992

Computational Science and Its Applications

- ICCSA 2017 Osvaldo Gervasi 2017-07-13 The six-volume set LNCS 10404-10409 constitutes the refereed proceedings of the 17th

International Conference on Computational Science and Its Applications, ICCSA 2017, held in Trieste, Italy, in July 2017. The 313 full papers and 12 short papers included in the 6-volume proceedings set were carefully reviewed and selected from 1052 submissions. Apart from the general tracks, ICCSA 2017 included 43 international workshops in various areas of computational sciences, ranging from computational science technologies to specific areas of computational sciences, such as computer graphics and virtual reality. Furthermore, this year ICCSA 2017 hosted the XIV International Workshop On Quantum Reactive Scattering. The program also featured 3 keynote speeches and 4 tutorials.

Guidance for Professional Development in Drinking Water and Wastewater Industry

Archis Ambulkar 2015-02-15 Guidance for Professional Development in Drinking Water and Wastewater Industry recognises the water practitioners journey from the novice student

phase all the way to an established expert position, both on technological and professional fronts. This book reviews various career phases and helps realise purpose, motivation, responsibilities and milestones for each professional stage. Since professional journeys are significantly different for individuals and designations, titles vary widely from organization to organization, general terminologies are used for describing career phases, mainly Student Phase, Entry-Level Professional, Mid-Level Professional and Established Practitioner. This guide helps the reader to understand a step-by-step professional development process in the industry and at the same time receive key inputs to minimise or avoid common mistakes related to the drinking water or wastewater occupations. The book provides an overview of common educational options available for students including short-term courses, diploma and certificates, associate degrees, bachelor degree, masters degree,

*Downloaded from
mario03.annuncioonlinestore.com on
2023-04-23 by guest*

doctorate degree, post-doctoral fellowship and continued education. With respect to job profiles, the guide covers different professional avenues such as consultant, engineer, designer, researcher, academic faculty member, sales and marketing, permitting authority staff, laboratory professionals, system operators, construction management staff, manufacturing and industry staff. In terms of technological knowledge, both drinking water and wastewater infrastructure systems are reviewed in the book. Discussions on drinking water systems mainly include intake structures, treatment systems, distributions network components whereas wastewater systems include collection and conveyance systems, treatment options and sludge management systems. Guidance for Professional Development in Drinking Water and Wastewater Industry is useful for every professional in the industry and particularly prospective students. It can be used by mentors and established practitioners as a guidance tool for training

newcomers. Author: Archis Ambulkar, Harrisburg, PA, USA
Public Roads 2004 "Established in 1918, Public Roads is the premier quarterly magazine of the Federal Highway Administration (FHWA). Each issue covers the latest in highway research and development, innovation and technology, and program advancements that benefit the Nation and create safer, more resilient roadways and structures. Public Roads emphasizes the continuing commitment of FHWA to be an international leader in promoting highway research and technology transfer for transportation professionals across the Nation and around the world. The more than 100-year-old magazine explores advances and innovations in highway, traffic, and bridge research and technology; critical national transportation issues; program advancement and achievements of FHWA and others in the highway community; and timely subjects of interest to industry professionals. For almost 80 years, Public Roads

Downloaded from
mario03.annuncioonlinestore.com on
2023-04-23 by guest

was exclusively an in-house research journal for engineers, scientists, and economists. However, in the summer of 1993, Public Roads broadened its scope to represent all areas of FHWA while offering articles that appealed to a wider audience. The expanded audience now includes international, national, State, local, and Tribal transportation officials; members of highway-related professional societies and associations; researchers at technical libraries and technology transfer centers; professors and students of engineering and traffic management; members of pertinent congressional committees; and others interested in highway research and technology and FHWA policies and programs." - Federal Highway Administration website.

Better Roads 2001

Cost Estimating Manual 2021

Procedures Guide for Right-of-way Cost Estimation and Cost Management Stuart D.

Anderson 2009 This procedures guide presents practical and effective approaches for

developing right-of-way (ROW) cost estimates and for then tracking and managing ROW cost during all phases of project development, including planning, programming, and preliminary and final design. It is a resource for managers, practitioners, and decision makers interested in developing and managing realistic and accurate estimates of ROW cost from the earliest ROW cost estimate made during planning through to the management of ROW acquisition cost during final design.

Conceptual Cost Estimating Manual John S. Page 1996-06-14

Walker's Manual for Construction Cost Estimating Vick S. Crespin 1981

Effective Project Scoping Practices to Improve On-time and On-budget Delivery of Highway Budgets Stuart Anderson 2016 This guidebook demonstrates how a state transportation agency (STA) can improve its project scoping process (PSP) and practices to produce a project cost estimate and schedule that facilitate

Downloaded from
mario03.annuncioonlinestore.com on
2023-04-23 by guest

programming decision making and accountability. It illustrates the effort needed to develop a robust cost estimate and then manage to a baseline budget and scope throughout the project delivery cycle. The guidebook consists of two parts. Part 1, "Research Results about the PSP," addresses the following issues: why STAs should formalize the PSP; current practices for PSP; and how agencies can implement an effective PSP. Part 2, "Implementation Guidelines," provides an easy-to-understand layout and describes how to implement the PSP. The guidelines are divided into three sections. Each section details one of the three major activities of the PSP—develop the project, analyze the alternatives and document findings, and develop the recommended alternative. The guidelines also have two appendices. The first appendix summarizes the tools that can be used while performing different activities in the scope development process. The second appendix is the list of online links to various resources and

tools to support the PSP, as referenced in this guidebook.

Transportation Research Record 2003

Cost Estimator's Reference Manual Rodney

D. Stewart 1995-04-03 In today's

hypercompetitive global marketplace, accurate costestimating is crucial to bottom-line results.

Nowhere is this moreevident than in the design and development of new products andservices.

Among managing engineers responsible for developingrealistic cost estimates for new

product designs, the number-onesource of information and guidance has been the Cost

Estimator'sReference Manual. Comprehensive, authoritative, and practical, the Manual

instructsreaders in the full range of cost estimating techniques andprocedures currently

used in the fields of development,

testing,manufacturing, production, construction, software, generalservices, government

contracting, engineering services,

scientificprojects, and proposal preparation. The

Downloaded from
mario03.anunciacaoonlinestore.com on
2023-04-23 by guest

authors clearly explain how to go about gathering the data essential to preparing a realistic estimate of costs and guide the reader step by step through each procedure. This new Second Edition incorporates a decade of progress in the methods, procedures, and strategies of cost estimating. All the material has been updated and five new chapters have been added to reflect the most recent information on such increasingly important topics as activity-based costing, software estimating, design-to-cost techniques, and cost implications of new concurrent engineering and systems engineering approaches to projects. Indispensable to virtually anyone whose work requires accurate cost estimates, the Cost Estimator's Reference Manual will be especially valuable to engineers, estimators, accountants, and contractors of products, projects, processes, and services to both government and industry. The essential ready-reference for the techniques, methods, and procedures of cost estimating COST

ESTIMATOR'S REFERENCE MANUAL Second Edition Indispensable for anyone who depends on accurate cost estimates for engineering projects, the Cost Estimator's Reference Manual guides the user through both the basic and more sophisticated aspects of the estimating process. Authoritative and comprehensive, the Manual seamlessly integrates the many functions--accounting, financial, statistical, and management--of modern cost estimating practice. Its broad coverage includes estimating procedures applied to such areas as: * Production * Software * Development * General services * Testing * Government contracting * Manufacturing * Engineering * Proposal preparation * Scientific projects * Construction This updated and expanded Second Edition incorporates all the most important recent developments in cost estimating, such as activity-based costing, software estimating, design-to-cost techniques, computer-aided estimating tools, concurrent engineering, and life cycle costing.

Downloaded from
mario03.annuncioonlinestore.com on
2023-04-23 by guest

For engineers, estimators, accountants, planners, and others who are involved in the cost aspects of projects, the Cost

Estimator's Reference Manual is an invaluable information source that will pay for itself many times over.

WSDOT's Scoping and Cost Estimating for Highway Construction Projects John Woolley 2010

Transportation System Management Alternative Capital Cost Estimate Results Report 1991

An Evaluation of the Cost Effectiveness of HOV Lanes Cy Ulberg 1987

Government Reports Annual Index 1993
Public Roads 2004-07

Guidance for Implementation of the AASHTO Strategic Highway Safety Plan 2004

Cost Estimating Manual For Wsdot Projects

Welcome to mario03.anunciacaoonlinestore.com, your go-to destination for a vast collection of **Cost Estimating Manual For Wsdot Projects** PDF eBooks. We are passionate about making the world of literature accessible to everyone, and our platform is designed to provide you with a seamless and enjoyable for Cost Estimating Manual For Wsdot Projects eBook downloading experience.

At mario03.anunciacaoonlinestore.com, our mission is simple: to democratize knowledge and foster a love for reading Cost Estimating Manual For Wsdot Projects. We believe that everyone should have access to Cost Estimating Manual For Wsdot Projects eBooks, spanning various genres, topics, and interests. By offering Cost Estimating Manual For Wsdot Projects and a

Downloaded from
mario03.anunciacaoonlinestore.com on
2023-04-23 by guest

rich collection of PDF eBooks, we aim to empower readers to explore, learn, and immerse themselves in the world of literature.

In the vast expanse of digital literature, finding Cost Estimating Manual For Wsdot Projects sanctuary that delivers on both content and user experience is akin to discovering a hidden gem. Enter mario03.anunciacaoonlinestore.com, Cost Estimating Manual For Wsdot Projects PDF eBook download haven that beckons readers into a world of literary wonders. In this Cost Estimating Manual For Wsdot Projects review, we will delve into the intricacies of the platform, exploring its features, content diversity, user interface, and the overall reading experience it promises.

At the heart of mario03.anunciacaoonlinestore.com lies a diverse collection that spans genres, catering to the voracious appetite of every reader. From

classic novels that have withstood the test of time to contemporary page-turners, the library pulsates with life. The Cost Estimating Manual For Wsdot Projects of content is evident, offering a dynamic range of PDF eBooks that oscillate between profound narratives and quick literary escapes.

One of the defining features of Cost Estimating Manual For Wsdot Projects is the orchestration of genres, creating a symphony of reading choices. As you navigate through the Cost Estimating Manual For Wsdot Projects, you will encounter the perplexity of options — from the structured complexity of science fiction to the rhythmic simplicity of romance. This diversity ensures that every reader, irrespective of their literary taste, finds Cost Estimating Manual For Wsdot Projects within the digital shelves.

In the realm of digital literature, burstiness is not just about variety but also the joy of

discovery. Cost Estimating Manual For Wsdot Projects excels in this dance of discoveries. Regular updates ensure that the content landscape is ever-changing, introducing readers to new authors, genres, and perspectives. The unpredictable flow of literary treasures mirrors the burstiness that defines human expression.

An aesthetically pleasing and user-friendly interface serves as the canvas upon which Cost Estimating Manual For Wsdot Projects paints its literary masterpiece. The website's design is a testament to the thoughtful curation of content, offering an experience that is both visually appealing and functionally intuitive. The bursts of color and images harmonize with the perplexity of literary choices, creating a seamless journey for every visitor.

The download process on Cost Estimating Manual For Wsdot Projects is a symphony of efficiency. The user is greeted with a

straightforward pathway to their chosen eBook. The burstiness in the download speed ensures that the literary delight is almost instantaneous. This seamless process aligns with the human desire for swift and uncomplicated access to the treasures held within the digital library.

A key aspect that distinguishes mario03.anunciacaoonlinestore.com is its commitment to responsible eBook distribution. The platform adheres strictly to copyright laws, ensuring that every download of Cost Estimating Manual For Wsdot Projects is a legal and ethical endeavor. This commitment adds a layer of ethical perplexity, resonating with the conscientious reader who values the integrity of literary creation.

mario03.anunciacaoonlinestore.com doesn't just offer Cost Estimating Manual For Wsdot Projects; it fosters a community of readers. The platform provides space for users to connect,

share their literary explorations, and recommend hidden gems. This interactivity adds a burst of social connection to the reading experience, elevating it beyond a solitary pursuit.

In the grand tapestry of digital literature, mario03.anunciacaoonlinestore.com stands as a vibrant thread that weaves perplexity and burstiness into the reading journey. From the nuanced dance of genres to the swift strokes of the download process, every aspect resonates with the dynamic nature of human expression. Its not just a Cost Estimating Manual For Wsdot Projects eBook download website; its a digital oasis where literature thrives, and readers embark on a journey filled with delightful surprises.

Cost Estimating Manual For Wsdot

Projects

We take pride in curating an extensive library of Cost Estimating Manual For Wsdot Projects PDF eBooks, carefully selected to cater to a broad audience. Whether youre a fan of classic literature, contemporary fiction, or specialized non-fiction, youll find something that captivates your imagination.

User-Friendly Platform

Navigating our website is a breeze. Weve designed the user interface with you in mind, ensuring that you can effortlessly discover Cost Estimating Manual For Wsdot Projects and download Cost Estimating Manual For Wsdot Projects eBooks. Our search and categorization features are intuitive, making it easy for you to find Cost Estimating Manual For Wsdot Projects.

Legal and Ethical Standards

mario03.anunciacaoonlinestore.com is committed to upholding legal and ethical standards in the world of digital literature. We prioritize the distribution of Cost Estimating Manual For Wsdot Projects that are either in the public domain, licensed for free distribution, or provided by authors and publishers with the right to share their work. We actively discourage the distribution of copyrighted material without proper authorization.

Quality: Each eBook in our collection is carefully vetted to ensure a high standard of quality. We want your reading experience to be enjoyable and free of formatting issues.

Variety: We regularly update our library to bring you the latest releases, timeless classics, and hidden gems across genres. There's always something new to discover.

Community Engagement: We value our

community of readers. Connect with us on social media, share your favorite reads, and be part of a growing community passionate about literature.

Join Us on the Reading Cost Estimating Manual For Wsdot Projects

Whether you're an avid reader, a student looking for study materials, or someone exploring the world of eBooks for the first time, mario03.anunciacaoonlinestore.com is here to cater to Cost Estimating Manual For Wsdot Projects. Join us on this reading journey, and let the pages of our eBooks transport you to new worlds, ideas, and experiences.

We understand the thrill of discovering something new. That's why we regularly update our library, ensuring you have access to Cost Estimating Manual For Wsdot Projects, celebrated authors, and hidden literary

treasures. With each visit, anticipate fresh possibilities for your reading Cost Estimating Manual For Wsdot Projects.

Thank you for choosing

mario03.anunciacaoonlinestore.com as your trusted source for PDF eBook downloads. Happy reading Cost Estimating Manual For Wsdot Projects.

Cost Estimating Manual For Wsdot Projects:

baxi luna max 310 fi manual bayesian computation with r manual solution bayliner trophy parts manual basic principles of membrane technology second edition basler regulator kr7f manual bc science ch 4 review answers battlefield trophy guide and roadmap bbm for nokia ashia 306 bc science chapter 5 test basic mechanical engineering lab manual mdu baywatch the inside story basic training for nursing at lilitha college basic metrology for iso 9000 certification bcf 10question paper 24 battlefield bad company award guide bcrich jmh5bv guitars owners manual bbc website design guidelines bb koala shabille toute seule bc socials 11 provincial study guide bayliner 185 trim and tilt manual battery mate charger 750h3 manual basketball sonnet 14 lines 10 syllables basic metrology iso 9000 certification bd prelim 12 test sheet basler electric kr7f manual basic

ionic knowledge worksheet answers basic troubleshooting in computer hardware basset hound training secrets bd 144 engine manual basic nursing seventh edition test bank bd vacutainer systems baxi combi boiler 105e manual batman gothic deluxe edition battle royal study guide basketball training guide batman a visual history basic skills physical science answers which law battery test practice questions diesel mechanic basic plumbing service skill answers battery charging diagram for 1994 club car ds batman complete guide baumatic f70 2 owners manual bauhn flat panel antenna manual bccs high school general biology curriculum map basic pistol shooting student manual basketball dribbling rubric bdu numerical statistics and analysis question paper battlefield 3 trophy guide and roadmap bbc news trevor manual speak out basic guide in power point baumatic btm25 1ss manual basic medication administration exam questions lpn basic technical drawing student edition basic

technology notebook for jss 2 battlefield prima
guide battleaxe book one of the axis trilogy
bayou classic kab6 manual bca design guide
basement waterproofing bayer contour glucose
meter user guide basic histology 12th edition
batter recipe onion ring basic patterns of
inheritance study guide answers bcom 3rd
semester english question paper basic
programming principles 2nd edition answers to
exercises baysens019b 91k91 manual batlabs
motorola service monitor r 2400a manual bass
amp buying guide basic student budget answers
chapter 7 battlecruiser modern naval fiction
library book 4 basic sciences in ophthalmology a
self assessment text battle of the beaks lab key
bayda bible bowl battle scars a collection of
short stories volume i bcn 36construction
estimating i basic math quick reference
handbook peter j mitas batesias v151rxxsa3
monitors owners manual bbm for s40 asha 210
bay city guide san francisco basic guide to
dental materials bath a satirical novel with

portraits english edition bazooka gaming
accessory owners manual bc science 10 study
guide bcom degree 1st year question paper
baumatic blender owners manual bc science
review answer key bcbs health plan comparison
guide basic hydraulic techican test basic science
theory for jss3 bece today basic stats practice
problems and answers basic technical
mathematics calculus edition battle of actium
study guide basic metric conversions study
guide basic engineering circuit analysis irwin
8th edition basic technology examination for jss
one battle damage assessment baystat 239
owners manual batman arkham city ps3 trophy
guide bayou owner manual bayer contour
glucometer bd class nine guide bcrich paolo
gregoletto signature warlock bass guitars
owners manual batman vol 2 the city of owls the
new 52 baxter syringe pump manual basic
technology for jss 2 3rd term scheme basic
microwave techniques and laboratory manual
battle of brooklyn answer key unit 8 bcm50

Downloaded from
mario03.annuncioonlinestore.com on
2023-04-23 by guest

installation and maintenance guide battery wiring diagram for 2006 club car precedent battle for yesterday batman arkham city game guide bc motorcycle riding manual bayliner force 85 hp motor manual bc fruit production guide baumatic b68ss owners manual basic plumbing services skills 2nd edition answers bazley hancock contemporary accounting 8th edition basic technology questions for jss2 baumatic pwk1 owners manual basic training manual 4th edition 2007 bauer and westfall university physics solutions manual bavaria 42 owners manual be awesome modern life for modern ladies be confident skills of becoming more confident bc science probe answers chapter 3 battlefield 3 co op campaign guide baxter aquarius manual basic skills test study guide usmc basic fitting guide for asu basic machines and how they work naval education baxter cycler manual battery pack for toyota prius basler decs 2manual bates39 guide to physical examination quizzes basic technology

for jss 2 note for 3rd term basic food preparation student guide bastien piano basics level 2 piano baumatic b187w b user manual basic lasagne recipe battery for motorola razr v3m bcom 1st year books basic guide to payroll batter recipe no egg basic life support provider manual basics and routine techniques turgeon bates guide to physical examination 11th battleship advanced mission manual basic life support 2010 basic knowledge pre employment practice test basic manual testing bcrpa fitness theory manual basics of biopsychology pinel study guide basic orientation plus study guide basic tub shower plumbing manual bds question papers 2009 battlefield 3 prima guide basic simulation lab manual bayliner motor serial number lookup bayou hero harlequin romantic suspense basic structure of the skin worksheet answers bazooka csa50 2 car amplifiers owners manual bc science 10 answer key basil instinct thorndike press large print mystery series basic orthodontic manual baxi prime ht 280 service manual

baughman the oklahoma scout personal
reminiscences baxter gas rack oven service
manual ov200g bayliner 3587 wiring diagram
battle story mafeking 1900 baxi luna 5 310 fi
manual basic nursing workbook 10th edition
answers key bba sample question paper bca
question paper fifth sem bayliner 24owners
manual basic rigging training manual baume
and mercier 8442 watches owners manual
bayliner 205 owner manual 2015 baxa repeater
pump manual basic practical microbiology a
manual baxter revolving gas oven manual basic
victoria sponge recipe bayou des enfants
rougaroux social club book 4 bauer t182 duoplay
automatic francais deutsch nederlandse bbm
untuk hp nokia xpres 205 basic manual for the
lawyers assistant battlefield 4 game guide basic
geriatric nursing 5th edition test bank baxter
oven parts manual batter ingredient recipe
tempura basic grammar rules cheat sheet basic
not boring middle school science answers basic
life support instructor manual basics of fall

protection user guide baxter bxa1g installation
manual batman the killing joke deluxe edition
bayou backslide a cajun murder mystery series
basic hand tools test basic medical billing guide
basic physics and measurement in anaesthesia
bbq fried chicken recipe bass fishing home la
page report basketball poems 15 lines basketball
poems 20 lines baxi combi 130he installation
instructions manual basquiat museum security
dieter buchhart bbw filmed and dominated in
public bbc radio lord of the rings 198ipod
audiobooks m4b battelle for kids vertical
progression guide basic stoichiometry phet lab
worksheet battlefield 2142 recon guide basic
english speaking guide basic medication test for
nurses basic technical mathematics with
calculus 10th edition basic pharmacology for
nurses clayton test bank bba 1 yr question paper
burdhwan univercity bayliner trophy 1903
manual bayliner 245 boat manual baxi nuvola ht
330 manuale battles of the new republic a
contemporary history of nepal bday wishes for a

church first lady basic technical mathematics
with calculus si version basketball camp
brochure template bayley scales administrations
manual basic outline of a paper basic english
grammar 4th edition bba entrance exam
question papers general awareness bazooka
mac6502b speakers owners manual battlefield
official strategy guide bass tender boat manual
battery fuse 97 camry battery cross reference
chart automotive bass tracker pro 17 service
manual batman dark victory new edition basics
engineering economy 1st edition solution
manual bb 8830 tips tricks and shortcuts manual
bass amplifier buying guide bcm50 installation
guide batter up english edition baumeister social
psychology study guide basic nursing 2 study
guide answer key basic engineering circuit
analysis 9th edition solution manual guide bcsp
study guide 2013 basic engineering circuit
analysis solutions 9th basiv education grade
11 mathematics 2012 basic orientation spanish
study guide basic engineering circuit analysis

9th edition solution manual bates guide to
physical examination pocket edition battlefield
heroes redeem codes 2014 august basic
polynomial operations worksheet 11 to 20
basketball flyers for high school templates
batman the ultimate guide to the dark knight
basketball poems 30 lines bc science 9 answers
for battery positive voltage circuit fuse of the
hvac control module batter mixture recipe bc
biology 11 study guide battlefield 4 manual
playstation 3 basic payroll knowledge bbm asha
205 dual sim bausch and lomb microscope
manual baxi 80e combi manual baumatic bc904
ovens owners manual bayer clinitek 50 user
manual bbq grillware ggpl 21 manual bca 3rd
semester operating system questions paper
basketball poem 16 line baxter oven manual baxi
luna 310 service manual basic piping
engineering drawing basics engineering
economy solutions manual basketball acrostic
poem examples basic structure and evolution of
vertebrates bayou 400 winch mount bayou born

fleur de lis series book english edition bc science
9 chapter6 bayou broccoli recipe basketball
acrostic phrases baume and mercier 8687
watches owners manual basketball training
journal template batman arkham city
collectables guide basics of the dribble drive
offense battlefield 4 instruction manual ps3
baumatic b240ss a ovens owners manual bates
guide to pharmacology bc science probe 9
baxter oven ov500 tech manual basketball
imagery poems rhyme basic jib crane

calculations excel batman no mans land t6 bdp
s550 owners manual baxi owners manual batter
icecream recipe basic medical questions and
answers in english bc science 9 textbook
answers basic mechanical engineering book
notes bcyf summer 2015 basic pharmacology for
nurses study guide elsevier battlefield heroes
codes july 2014 basic mechanical engineering
formulas pocket guide bayer contour meter user
manual bayliner ciera 2452 owners manual